



Quality of Service for WLR, MPF and GEA

Consultation on proposed quality of services
remedies

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Consultation

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About this document

This document sets out our proposals for regulating the quality of Openreach's services that are used by telecommunications providers to provide broadband and telephone services to customers and businesses. Most retail providers of broadband and telephone services in the UK (excluding the Hull Area) rely on access to Openreach's network for the delivery of these services.

The proposals we set out here form part of two formal reviews we are currently undertaking, namely the Wholesale Local Access and the Narrowband market reviews. These two market reviews set out a number of proposals for regulation of the wholesale markets for services that use fixed connections to provide broadband and telephone services.

The proposals we set out in this document are intended to strengthen and build on quality of service measures we introduced in 2014.

We will take all responses to this consultation into account before reaching our final conclusions on what quality of service regulation should apply to Openreach's wholesale broadband and telephone services. We expect any new proposals to come into effect from 1 April 2018.

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Section 1

Executive Summary

- 1.1 Homes and businesses rely on broadband more than ever before. This means that when things go wrong it is not just frustrating and inconvenient – it can cause real financial and non-financial harm.
- 1.2 Last year's Strategic Review of Digital Communications ("Strategic Review") highlighted how urgent improvements are needed to ensure that all phone and broadband companies provide service quality that customers expect. We set out our strategy to bring about a step change in quality of service, including plans to introduce transparent information on service quality and automatic compensation for consumers when things go wrong.
- 1.3 A key element of that strategy is to look to impose tougher requirements on Openreach, the division of BT that installs and maintains connections to BT's network on behalf of telecoms providers, to repair faults and install connections on time. This consultation looks in detail at these proposed Quality of Service standards which will strengthen and build on measures introduced by Ofcom in 2014.
- 1.4 The proposals form part of two formal reviews we are currently undertaking, namely the Wholesale Local Access market review (WLA) and the Narrowband market review (NMR). In those reviews, we have identified a concern that BT's market power means that it does not have sufficient incentives to deliver service that keeps pace with the increasing demands of telecoms providers and their customers. Our proposals are intended to incentivise Openreach to make significant further improvements in the quality of services it provides to telecoms providers to ensure effective competition that meets the needs of consumers and businesses.
- 1.5 Any final decisions we take in relation to quality of service will form part of the overall remedies package which will be included in our final WLA and NMR review Statements which we expect to complete by early 2018.

Background

- 1.6 Consumers and businesses are increasingly reliant on the internet and now consider broadband to be an essential part of their daily lives. Our research shows that 66% of consumers and 59% of small and medium-sized businesses would struggle without broadband and a further 23% and 25% respectively could only manage without it for a limited time.¹
- 1.7 Faulty lines, delayed repairs and installations not only affect customers; they can also impair competition in the wider market by, among other things, discouraging people from switching between providers.
- 1.8 Service problems fall into several categories. They can occur at the telephone exchange on the lines that connect homes and businesses, or be due to factors

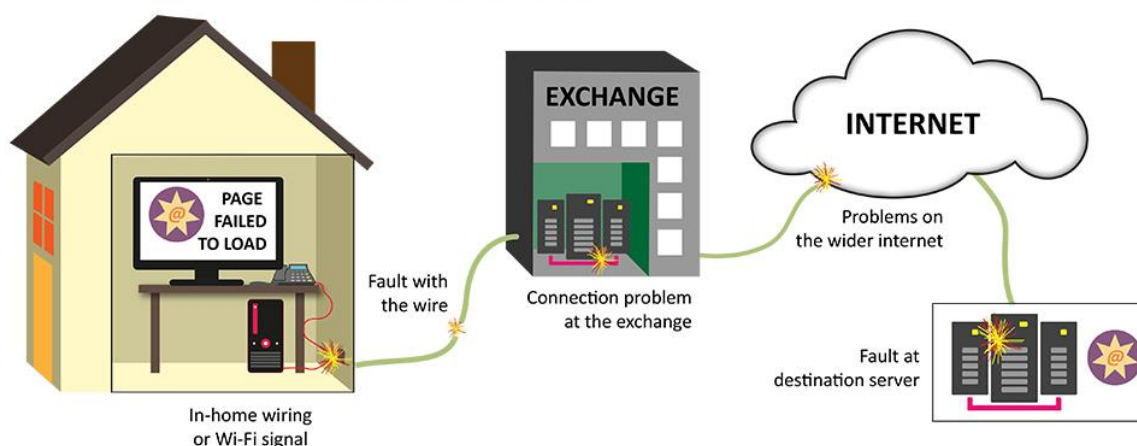
¹ Jigsaw Research, 2017. *Automatic compensation: Consumer experience of provisioning delays, loss of service and missed appointments: Presentation of quantitative findings*, Slide 16 & 72
https://www.ofcom.org.uk/data/assets/pdf_file/0026/98711/automatic-compensation-jigsaw-report.pdf.

outside Openreach's control, such as faulty customer equipment, in-home wiring, poor customer service, etc.

Figure 1.1:

Why isn't this website working?

Possible locations of faults



Openreach fixes faults with the wire, **Other providers** fix the Wi-Fi router and some and some problems at the exchange. problems at the exchange and in their own network.

- 1.9 Therefore, the whole sector – not just Openreach - has a role to play in delivering significantly better quality of service than it does today.
- 1.10 Our Strategic Review recognised this and set out proposals to incentivise the whole industry to bring about real improvements. These include:
 - publishing performance tables on quality of service, identifying the best and worst providers on a range of performance measures so that customers can shop around with confidence. Our first annual Service Quality Report will be published shortly;
 - introducing automatic compensation for consumers affected by poor service quality. We have published a consultation document seeking stakeholder comments by 5th June 2017 and our intention is to publish a decision around the end of the year;
 - setting more demanding quality of service standards for Openreach and establishing them in new areas as appropriate;
 - setting wholesale price controls that strengthen Openreach's incentives to make long term investments in service quality; and
 - working with industry where poor coordination is affecting service quality.
- 1.11 Until relatively recently, we had expected that the requirement for Openreach to provide equivalent quality of service to all telecoms providers would have incentivised it to perform to a good standard.
- 1.12 Although we would have preferred if Openreach itself had delivered high service quality because of its own focus on customer needs, we are having to step in because service outcomes are not sufficient to ensure that telecoms providers can

compete effectively in the retail market and that customers do not suffer harm. This consultation document sets out our latest thinking in this area. The standards we propose set a minimum baseline, and we expect BT not just to achieve them, but to aim beyond them.

- 1.13 To further incentivise better service performance by Openreach and to help deliver a real step change in quality, we are also:
- aiming to increase competition to Openreach, e.g. through duct and pole access (DPA); and
 - ensuring that retail competition focuses on the quality of services, as well as price, by ensuring that consumers are aware of the quality of service offered by different providers.
- 1.14 We believe that such competition, where it is effective, is the best way of driving quality throughout the telecoms sector.

The need for tougher standards

- 1.15 In 2014 we introduced quality of service standards requiring Openreach to speed up broadband and telephone repairs and installations. These rules (the first of their kind imposed on BT) were intended to address a level of performance that was clearly unacceptable and restore it to previous levels. If Openreach breaches these rules, we have the powers to impose material financial penalties up to 10% of BT's relevant turnover.
- 1.16 They have driven improved levels of Openreach service but there are several reasons why further action is now needed:
- Customer expectations are changing. We now expect more from our communication services – including better quality of service – and this is only going to increase in future.
 - Openreach has also not performed beyond the necessary minimum in the case of repairs and has itself recognised that it needs to up its game on service.
 - Openreach capital expenditure has been lower than our forecast over recent years. While this has not yet led to an increase in faults, continued under-investment could have very serious consequences, including more frequent future outages. While we are encouraged by recent Openreach commitments to invest in the health of its network, there remains a risk that competing priorities may curtail these plans. We believe that tougher quality of service standards will incentivise Openreach to invest in its network.
 - The current quality of service standards mean around 20% of repairs are not completed within one or two working days, while in over 5% of cases consumers need to wait over five days for their problem to be resolved.
 - The standards also do not apply to fibre to the cabinet (FTTC) superfast broadband. With more people taking up superfast broadband, there is a risk that, if Openreach was challenged operationally, it would concentrate on the areas where targets already exist to the detriment of superfast broadband customers.

Overview of our proposals

- 1.17 The proposals are summarised below. Our aim is to incentivise Openreach to improve the quality of services it delivers to telecoms providers, and through them to broadband and voice customers, while striking an appropriate balance between benefits for competition and consumers, Openreach's operational constraints, and costs.

Approach to fault reduction

- 1.18 Improvements to the reliability of the Openreach network would be beneficial for both telecoms providers and consumers.
- 1.19 In our work on Cross Platform Switching we estimated the harm caused by a service being out of action – as well as the hassle of arranging for the fault to be rectified - to be around £83 per incident.²
- 1.20 We believe that our proposal for more demanding repair standards, set out below, will provide a strong incentive for Openreach to address the reliability of its network by increasing its capital expenditure in this area. Between 2014/15 and 2015/16 Openreach did not spend all the capital expenditure we allowed for in the regulated charges we set in this market, choosing instead to incur higher operational expenditure. This strategy is, in our view, not sustainable in the medium to longer term, as it could lead to significant degradation in the network and consumer harm.
- 1.21 We welcome Openreach's recently announced plan to invest in the health of its network, but are not proposing to make any additional capital expenditure allowance in this review for this investment programme over and above what we consider is appropriate for the maintenance of an ongoing efficient network providing a good quality of service.
- 1.22 Fault rates also play an important part when we set wholesale pricing controls. These controls give BT the opportunity to recover efficiently incurred costs of operating its network. We are proposing that BT only be allowed to recover maintenance costs consistent with the faults target it has set itself.
- 1.23 A fuller discussion of how the forecast fault rate interacts with our proposed charge controls is set out in our 2017 WLA Market Review consultation which we have also published today.³

Binding quality standards for fault repairs

- 1.24 Phone and broadband providers choose a service level which defines how quickly Openreach commits to carry out fault repairs (either one or two working days of being notified in most cases).
- 1.25 Under our new proposals, from 2021 Openreach must complete 93% of fault repairs within one or two working days, depending on the service level the telecoms provider

² Ofcom, 2016 *Making Switching Easier and More Reliable for Consumers*.

https://www.ofcom.org.uk/data/assets/pdf_file/0030/58845/making-switching-easier.pdf.

³ Ofcom, 2017. *Wholesale Local Access Market Review*. <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review>.

chooses. This is an increase on the current requirement of 80%, which was set when Openreach's performance was much lower.

- 1.26 In addition, we propose a secondary quality standard to protect customers that fall outside the 93%: Openreach will be required to complete 97% of repairs no later than six or seven working days, dependent on service level.

Table 1.2: Binding quality standards for repair (WLR, MPF and GEA-FTTC⁴)

	Current standard	Proposed new standard
	Nov 2016 to March 2018	Year 3 (2020/21)
% of repairs to be completed within 1 or 2 working days depending on Service Level (Adjusted standard for <i>force majeure</i>)	80% (77%)	93% (90%)
% of repairs to be completed within Service Level timescales + 5 working days (for each of 1 or 2 working day Service Level (Adjusted standard for <i>force majeure</i>))	n/a	97% (94%)

- 1.27 We propose that these quality standards for fault repairs apply to all main phone and broadband services used by homes and businesses, including fibre to the cabinet (FTTC) superfast broadband.
- 1.28 Compliance with these repair standards will be assessed by measuring the combined performance of wholesale voice and broadband lines. It will also be assessed on a regional basis to prevent any geographic bias. We have also considered an appropriate glidepath for Openreach to achieve the repair QoS standards (see Section 5).

Binding quality standards for installations

- 1.29 By 2021 connections should be installed on the date agreed between Openreach and the telecoms provider on 95% of occasions (up from 90% now).

Table 1.3: Binding quality standards for installation date certainty (WLR, MPF and GEA-FTTC)

	Current standard	Proposed new standards
		Year 3 (2020/21)
% of installations to be completed by the committed date (Adjusted standard for <i>force majeure</i>)	90% (89%)	95% (94%)

⁴ Generic Ethernet access fibre to the cabinet, or GEA-FTTC, is BT's wholesale product providing telecoms providers with access to BT's FTTC network to supply higher speed broadband services. BT currently meets its obligation to provide VULA using GEA services.

1.30 In cases where an engineer visit is needed to install the connection, we propose that by 2021:

- Openreach provide an appointment for installations within ten working days of being notified (currently 12 working days); and
- Openreach offer a ten working day appointment date 90% of the time rather than the current 80%.

Table 1.3: Binding quality standards in relation to first available appointment date for installations requiring an engineer visit (WLR, MPF and GEA-FTTC)

	Current standard	Proposed new standards Year 3 (2020/21)
Number of working days offered for installation appointments	12	10
Frequency with which regulated installation appointment date must be offered (Adjusted standard for <i>force majeure</i>)	80% (79%)	90% (89%)

1.31 As with the repair standards, compliance with the installation standards above will be assessed by measuring the combined performance of wholesale voice and broadband lines.

1.32 We have also considered an appropriate glidepath for Openreach to achieve the installation QoS standards (see Section 6).

Transparency requirements

1.33 We also propose that Openreach must continue to provide Ofcom with information on how it has performed against these standards. This will include detailed information – such as causes - in those cases where it has failed to hit the required standard.

1.34 Openreach will also have to publish clear, meaningful and transparent information about how long it is taking to repair faults and install new lines, allowing consumers to keep track of its performance.

1.35 We propose to modify our key performance indicators (KPIs) requirements, with some additions, deletions, and simplifications.

Service Level Agreements (SLAs) and Service Level Guarantees (SLGs)

1.36 Currently, when Openreach fails to repair faults in line with its one or two working day service level agreement, it needs to pay daily compensation to retail telecoms providers up to a maximum of 60 working days. The evidence we have reviewed indicates that a material number of faults remain unrepaired after this period. To ensure the continued effectiveness of these service level guarantee payments, we are proposing that there should be no caps on the periods over which fixed compensation is payable. On a similar basis, we propose to remove the cut off period for installation SLGs. These arise when Openreach fails to install a service on the date promised.

- 1.37 The Office of the Telecommunications Adjudicator should continue to oversee the industry process for negotiating new or modifications to existing service level agreements and service level guarantees. We also expect if retail providers need to pay automatic compensation to customers they would use this process to negotiate arrangements in instances where responsibility for failure lies with Openreach.

Consultation and next steps

- 1.38 We invite comments from stakeholders on the proposals in this document. The consultation runs for ten weeks and the deadline for responses is 9 June 2017. Annex 1 provides further details of how to respond.
- 1.39 We aim to publish our conclusions in early 2018.

Section 2

Background

Introduction

- 2.1 Ofcom recently published its wholesale Narrowband Market Review Consultation (2016 NMR Consultation) and, alongside this document, has published its Wholesale Local Access Market Review Consultation (March 2017 WLA Consultation). In those consultations, we propose to make a finding that BT has significant market power (SMP) in the wholesale fixed analogue exchange line (WFAEL) and wholesale local access (WLA) markets. To address that market power we are proposing to impose on BT several obligations, including the requirement for it to provide telecoms providers with access to BT's networks and services. We have also identified concerns in relation to BT's quality of service (QoS) in these markets, and proposed regulation to enable us to set appropriate quality of service standards to ensure that BT (via Openreach⁵) delivers fair, reasonable and timely network access. We therefore proposed direction-making powers that allow us to set quality standards and reporting requirements for services in these markets. This consultation sets out our proposals for regulated quality standards to be imposed on BT in these markets to address its SMP, as well as transparency obligations on BT in relation to its performance in these markets. We also explain what other steps we consider Openreach and other telecoms providers can take to improve customers' experience of the broadband and voice services they use.
- 2.2 This section provides context to our proposals, including an overview of current quality of service regulation applicable to BT and a brief overview of our work in related areas. We conclude with the regulatory framework and summary of the structure of this consultation.

Openreach quality of service

- 2.3 The provision of telecoms services requires multiple parties to coordinate their activities, although, for the most part, this is invisible to customers. From the customer perspective, a range of factors determine the 'quality' of a fixed telecoms service. For example, customers expect an 'always on' connection at consistent speeds (in the case of broadband), and without loss of service. If the service develops a defect, the customer's experience of a telecoms provider's call centre can also affect their view of the quality of the service they receive.
- 2.4 When a problem occurs, customers often do not know where it originates, or whether the root cause lies with their retail provider or a third party. For example, a customer's experience of fixed broadband can be affected by factors ranging from demand on servers outside the UK, to problems in their telecoms provider's network, to the local access network (e.g. Openreach's fibre/copper network), or to in-home wiring and WiFi equipment.
- 2.5 Most telecoms providers (except Virgin Media and telecoms providers in the Hull Area) rely on the access network owned by BT and operated by Openreach, to deliver their services to end users' premises. For this reason, Openreach and its

⁵ We note that Openreach does not operate in Northern Ireland, but for simplicity refer to Openreach throughout as the operator of BT's network.

engineers have a significant impact on the quality of service that customers using its network experience. For the purposes of this consultation we focus on two key facets of Openreach's quality of service:

- Repair – when a fault originates in Openreach's fixed access network, telecoms providers must engage with Openreach and arrange for it to conduct a repair. The likelihood of a fault occurring is, in part, determined by how Openreach maintains its network.
- Installation – retail telecoms providers require the involvement of Openreach engineers to provision services, for example to install new lines to the customer's premises, or to switch the customer from one provider to another.

2.6 Our quality of service remedies relate to Openreach's performance in repairing faults and installing new lines. In this review, we also consider Openreach's historical and planned investment in the quality of its network and the implications for fault rates in the future, as well as steps telecoms providers (including Openreach) are taking to improve network diagnostics when service problems occur.

What we mean by repairs

2.7 Customers will inevitably experience faults with their communications services from time to time. A number of these faults can be resolved directly by customers' telecoms providers, but in many cases the telecoms provider will need to arrange for Openreach to visit the customer to resolve the fault. The wholesale services purchased by telecoms providers for the delivery of telephone and broadband services to their customers come with an associated 'service maintenance level' (also referred to as SML, or care level). The SML selected by the telecoms provider sets the contractual time period by which Openreach should repair faults.

2.8 When renting a wholesale access line to a telecoms provider, Openreach offers several SMLs which relate to the speed at which it contractually agrees to repair faults. Essentially, a faster repair time means a more expensive annual rental price. The five care levels Openreach currently offers are:

- SML1: Fault clear by 23:59 day after next, Monday to Friday, excluding public and bank holidays;
- SML2: Fault clear by 23:59 next day, Monday to Saturday, excluding public and bank holidays;
- Business 2 Plus: Prioritised on the day, fault clear by 23:59 next day, Monday to Saturday, excluding public and bank holidays;
- SML3: Report by 13:00, fault clear by 23:59 same day. Report after 13:00, fault clear by 12:59 next day, seven days a week, including public and bank holidays; and
- SML4: Fault clear within six hours, any time of day, any day of the year.⁶

⁶ Openreach, *Fact Sheet: Service Maintenance Levels*.

<https://www.openreach.co.uk/orpg/home/products/serviceproducts/serviceharmonisation/serviceharmonisation/downloads/servicemaintenancelevelsfactsheet.pdf> [accessed 23 March 2017].

- 2.9 Telecoms providers can choose one or more specific SMLs for the services they offer their customers. The great majority of connections for an access service are provided at the SML1 and 2 levels and therefore our QoS regulation to date has focused on these particular care levels.
- 2.10 In the event that defects reported by customers do not appear as faults on the Openreach network when initial diagnostic tests are carried out by Openreach, telecoms providers may request an 'out of tariff' service from Openreach known as Special Fault Investigation (SFI)⁷ or Broadband Boost (BBB).⁸ Openreach will only levy a charge for these services if the fault is subsequently found to be within the telecoms provider's or customer's domains. These repairs are not included within the scope of the current repair standards.

What we mean by installations

- 2.11 Residential and business customers order fixed telephone and/or broadband services from telecoms providers typically when:
- choosing to switch from one telecoms provider to another;
 - moving from one property or premises to another (where the new property or premises may or may not have an existing network connection);
 - choosing a new service or package of services (e.g. upgrading from current generation to superfast broadband); or
 - a combination of the above.
- 2.12 To supply the services ordered by customers, telecoms providers may place orders with Openreach to install types of fixed line access services which suit their business operations and enable them to deliver the services their customers want. For example, a telecoms provider might be providing its customer with fixed telephone and standard broadband services over a copper line rented from Openreach but using its own electronic equipment rather than BT's. If the customer later wants a superfast broadband service, the telecoms provider could choose to supply this by renting a fibre access service from Openreach and arranging with it to have this connection installed for the customer.
- 2.13 The main wholesale fixed access line products which many telecoms providers rent from Openreach to provide telephone and broadband services to customers are:
- Wholesale Line Rental (WLR), which allows telecoms providers to rent telephone lines on wholesale terms from BT, and resell the lines to customers, providing a

⁷ SFI, or SFI2, is a chargeable investigation product that attempts to identify and resolve problems affecting Digital Subscriber Line (DSL) services. They can be initiated by a telecoms provider when an MPF or SMPF service is apparently working within the LLU contractual specification of SIN349 and is testing OK on Openreach line test systems, but there might be a problem with the telecoms provider's Asymmetric Digital Subscriber Line (ADSL) or Symmetric Digital Subscriber Line (SDSL) service.

⁸ An Openreach chargeable service that aims to improve the speed, quality and reliability of a telecoms provider's customer's broadband connection. The service offers an engineering option that covers the customer's, telecoms provider's and Openreach's network to investigate and attempt to resolve issues that may impact the customer's DSL service. Additional variants for superfast broadband services are also available.

single bill that covers both line rental and, when combined with a wholesale calls product, voice calls;

- Metallic Path Facility (MPF), which allows telecoms providers to rent copper access lines on wholesale terms from BT, and connect the lines to their own electronic equipment to offer voice and broadband services to customers; and
- Generic Ethernet Access (GEA), BT's wholesale product providing telecoms providers with access to BT's fibre networks (FTTC⁹ and FTTP¹⁰) to supply higher speed broadband services.

- 2.14 For each of the above, we recognise that industry and Openreach use many different terms to describe order types such as new provides, transfers, and migrations, or order types which reflect the existence or state of any line to the premises to be served – e.g. new lines, start of stopped lines, and working line takeovers.
- 2.15 We refer to all orders for network access as 'installations' in this document. However, we do not consider separate or subsequent orders to carry out related work, such as to change or modify the features or service levels associated with the network access provided, to be installations for the purposes of this document.

Regulation of Openreach's quality of service to date

- 2.16 The quality standards and reporting requirements currently in place were set in the 2014 Fixed Access Market Review ('2014 FAMR'), and updated in our October and November 2016 *Directions and Consents relating to the minimum standards and KPIs imposed in the 2014 Fixed Access Market Reviews* ('the 2016 Directions and Consents').¹¹¹² These decisions are described below.

2014 FAMR

- 2.17 In the 2014 FAMR, Ofcom undertook a review of matters relating to quality of service delivered by BT (through Openreach) in the supply of regulated wholesale fixed access services (which included the WFAEL, wholesale ISDN30¹³, and wholesale ISDN2¹⁴ markets).¹⁵ We determined that over several years, from 2009, there had been a gradual decline in Openreach's performance, particularly in relation to fault repairs and provisioning of WLR and MPF services. We also concluded that the prevailing regulatory and contractual framework had not been sufficient to prevent material detriment to downstream competition in the fixed access markets, arising out of BT's SMP.

⁹ Fibre to the cabinet.

¹⁰ Fibre to the premises.

¹¹ https://www.ofcom.org.uk/_data/assets/pdf_file/0032/92678/20161017-QoS-Statement_Non-confidential.pdf.

¹² https://www.ofcom.org.uk/_data/assets/pdf_file/0016/94300/Further-QoS-Statement.pdf.

¹³ ISDN30: A digital narrowband access service supporting up to 30 64 Kbit/s channels, which is used most commonly to provide multiple telephone lines to larger businesses.

¹⁴ ISDN2: A digital narrowband access service for businesses which provides two 'channels' at 64 Kbit/s each.

¹⁵ <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/telecoms-competition-regulation/narrowband-broadband-fixed/fixed-access-market-reviews-2014>.

Quality of service standards for WLR and MPF

- 2.18 As a result of the observed decline in BT's performance, we took a number of steps to incentivise better service quality outcomes. Specifically, we imposed on BT a number of new SMP obligations, including setting service quality standards covering provisioning and repair for WLR and MPF, the main copper-based access services.¹⁶ In doing so, we were mindful of the potential for unintended consequences and of the need to be cautious in introducing such SMP regulation for the first time.
- 2.19 We set QoS standards on how quickly Openreach offered an appointment for engineering visits for provisions and on the proportion of installations completed by the contractually agreed date (committed date), each with a fixed 1% allowance for Local 'Matters Beyond Our (BT's) Reasonable Control' ('MBORC') events.¹⁷
- 2.20 In terms of repair, at the time of the FAMR, the majority of WLR lines provided by Openreach were associated with a service maintenance level 1 (SML1) repair service level agreement (SLA) – typically a 'two day' repair. Meanwhile, the majority of MPF lines were provided at SML2 – i.e. a 'one day' repair.¹⁸ We decided it was appropriate to align our regulation to these product/SML combinations and set a QoS standard on the proportion of repairs completed within the contractual SLAs, with a fixed 3% allowance for Local MBORC events (often referred to as *force majeure*).
- 2.21 The provision and repair standards increased over the three-year, forward-look period of the 2014 FAMR, as summarised by Table 2.1 below:

Table 2.1: Openreach quality standards for WLR and MPF services

QoS standard	First year (2014/15)	Second year (2015/16)	Third year (2016/17)
12 day provision appointment availability	55% (54%)	68% (67%)	80% (79%)
Provision completion by Committed Date	90% (89%)	90% (89%)	90% (89%)
Repair completion within SLA timescales	70% (67%)	75% (72%)	80% (77%)

Note: percentages reflect standards excluding and/ (including) fixed allowances for force majeure (Local MBORCs).

Quality of service standards for GEA

- 2.22 In the 2014 FAMR, we did not introduce quality standards for GEA services. At the time, the take up of GEA services was low and we focused on what we considered to be the key access products purchased by telecoms providers at that time.¹⁹

¹⁶ We imposed these annual standards in each of Openreach's 10 geographic regions (East Anglia, London, North East, North Wales & North Midlands, Northern Ireland, Scotland, South East, South Wales and South Midlands, and Wessex).

¹⁷ MBORC means a *force majeure* event that releases Openreach from the liability to make any payment under the corresponding SLG. We also allowed BT to make use of what are referred to as 'High Level MBORC' declarations within the performance calculations for up to two regions per year.

¹⁸ Telecoms providers may purchase different repair packages for their wholesale inputs (WLR, LLU, VULA, and ISDN) ranging from a 'two day' repair (SML1) to a 'six hour' repair (SML4)).

¹⁹ Ofcom, 2014. *Fixed Access Market Reviews – Volume 1*, (2014 FAMR), paragraphs 11.66-71.

https://www.ofcom.org.uk/_data/assets/pdf_file/0032/78863/volume1.pdf.

Key performance indicator (KPI) reporting requirements

- 2.23 In addition to QoS standards for WLR and MPF, the 2014 FAMR directed BT to report a set of KPIs for WLR, ISDN30, ISDN2, MPF, SMPF²⁰ and GEA (FTTC and FTTP). This decision increased the range and granularity of the KPIs that BT is required to report to Ofcom and to industry, thereby allowing us to monitor Openreach's performance more closely and, if necessary, respond to any trends.²¹

2016 Directions and Consents

- 2.24 In our 2016 Directions and Consents, we implemented new standards based on the repair of WLR and MPF faults subject to each of SML1 and 2. This was in response to the decisions of a number of telecoms providers to change the SML associated with their purchase of WLR or MPF. Without intervention, this would have resulted in a significant proportion of total WLR and MPF lines falling outside the repair standards implemented in our 2014 FAMR. To ensure that appropriate standards continued to apply in these markets, we therefore introduced a single standard for each of the two care levels that covers both MPF and WLR.
- 2.25 In addition, we removed the expiry dates for all WLR and MPF standard obligations and replaced these with an ongoing obligation to ensure that the standards remain in force until a new market review decision is published or until they are revoked, whichever is first. The 2016 Directions and Consents also amended some of the existing KPI requirements applying to MPF.

Quality of service regulation for Ethernet leased lines in 2016

- 2.26 In the 2016 Business Connectivity Market Review (BCMR),²² we found that BT had SMP in the wholesale provision of Ethernet services in several UK areas,²³ and that BT's quality of service in providing those services was unacceptable. Provisioning performance since 2011 had deteriorated and showed little sign of sustained improvement. We also found that, while the quality of BT's repairs of these services was broadly acceptable, this too could deteriorate if BT were to divert resources to improve service quality for provision.
- 2.27 We therefore imposed two sets of new obligations on BT to ensure that it has appropriate incentives to improve quality in its provision of wholesale Ethernet leased line services, while also not degrading its repair performance:

²⁰ Shared Metallic Path Facility (SMPF) is the provision of access to the copper wires from the customer's premises to a BT MDF that allows a competing provider to provide the customer with broadband services, while BT continues to provide the customer with conventional narrowband communications.

²¹ A subset of these KPIs (specifically in relation to the installation of new lines, repair of faults, and late installations and fault repairs) must be published with unrestricted access on a BT Group website every three months, within 14 working days of the end of that three-month period. See "Homes and smaller businesses": <https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 15 March].

²² Ofcom, 2016. *Business Connectivity Market Review*. https://www.ofcom.org.uk/_data/assets/pdf_file/0015/72303/bcmr-final-statement-volume-one.pdf.

²³ We also found that KCOM had SMP in the Hull Area for the provision of Ethernet services at the wholesale and retail levels, but did not impose QoS standards on KCOM.

- First, a QoS standard of certainty of delivery date which requires BT to improve on its current performance, reaching 90% by the end of the market review period (2018/19).
 - Second, we imposed QoS standards on provision lead-times and for fault repair. The standards require BT to deliver improvements in its provision lead-times over the first two years of the review period. The second and third year standards were set as a target 'mean time to provide' of 40 days, with a lower percentile limit of at least 40% of provisions delivered within 29 working days, and an upper limit of no more than 3% of provisions delivered in 118 or more working days. For repair, we required BT to maintain at least its current repair performance throughout the review period (i.e. to fix 94% of faults within five hours).
- 2.28 We further required BT to provide specified KPIs for its main Ethernet services and to offer the same service level agreements and guarantees (SLAs/SLGs) as we had previously directed until it negotiates with the industry a new set of SLAs/SLGs based on the new provisioning process that is being introduced.

Strategic Review of Digital Communications

- 2.29 In 2016 we published our Strategic Review of Digital Communications ('Strategic Review'), which set out our strategy for delivering a step change in quality of service in the light of the rising expectations of customers and businesses. Regarding Openreach's service quality, we explained that we have had to intervene more actively over time because Openreach is subject to limited competitive pressure at the wholesale level.
- 2.30 We stated that we intended to take the following steps to drive a step change in Openreach's service performance, including to:
- set standards at a level designed to ensure effective competition – so that Openreach's service performance meets the needs of customers and businesses – rather than at a level intended only to return performance to historical levels. Over time we expect to apply standards that rise significantly;
 - specify standards that protect customers from being left without service for extended periods (i.e. standards that control long tails of incomplete orders); and
 - apply standards to cover new aspects of service where we have concerns.

Proposed SMP conditions for WLR, MPF and GEA in 2016 and 2017

- 2.31 In the 2016 NMR Consultation and March 2017 WLA Consultation we set out our provisional findings that BT has SMP in the markets for:
- the supply of copper loop-based, cable-based, and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area; and
 - wholesale fixed analogue exchange line services in the United Kingdom excluding the Hull Area.²⁴

²⁴ The Narrowband Market Review also found BT had SMP in the wholesale ISDN30 and ISDN2 markets in the UK excluding the Hull Area.

- 2.32 The different wholesale access services that form part of the WLA and WFAEL markets are purchased by telecoms providers to deliver voice and broadband services to customers. The quality of these services therefore forms an important part of the customer experience of communications services over the Openreach network and is an influence on the effectiveness of competition between telecoms providers.
- 2.33 We refer to these markets together as ‘the wholesale fixed access markets’ unless specified otherwise. In these consultations, we proposed a set of SMP remedies which, amongst other things, would require BT to:
- provide general and specific forms of wholesale network access such as WLR, Local Loop Unbundling (LLU)²⁵ and Virtual Unbundled Local Access (VULA)²⁶;
 - provide network access on non-discriminatory terms and prices (in particular on an equivalence of inputs (EOI) basis); and
 - to publish Reference Offers which set out the terms and conditions of network access, including SLAs and SLGs.
- 2.34 We also identified the concern that, absent regulation, BT does not have the right incentives to continuously deliver an adequate level of service quality in relation to network access. We set out our view that inadequate quality of service delivered by BT has the potential to undermine the effective functioning of the network access remedy to the detriment of both consumers and downstream competition. Issues with quality of service also have the potential to adversely affect telecoms providers and the intensity of competition in the retail market by, among other things, discouraging switching. Along with the remedies listed above, we therefore proposed to set SMP conditions requiring BT to comply with all such QoS standards and reporting requirements as Ofcom may from time to time direct in relation to the wholesale fixed access markets.
- 2.35 The 2016 NMR Consultation closed on 29 March 2017, while the March 2017 WLA Consultation will close on 9 June 2017.

Other Ofcom projects on quality of service in fixed telecoms

- 2.36 In addition to the proposals described above, Ofcom is pursuing two other quality-related projects are described briefly below.

Automatic compensation

- 2.37 Electronic communications are becoming an increasingly essential part of people’s lives, and when things go wrong customers suffer harm. We are concerned that the market is not delivering sufficient protection to customers for failure in the quality of service that they receive.
- 2.38 We have therefore recently consulted on proposals that telecoms providers should pay compensation automatically to customers when things go wrong with their

²⁵ To meet this obligation Openreach provides two types of LLU service, MPF and SMPF.

²⁶ To meet this obligation Openreach provides Generic Ethernet Access (GEA) services.

landline and/or broadband services,²⁷ including delayed repair when a customer experiences a complete loss of service, a delay in the activation of a service, and missed engineer appointments. The consultation is relevant for residential customers, as well as for some microbusinesses who use residential products.

Service Quality reports

- 2.39 Further, Ofcom will soon publish its first annual report on Service Quality. The report will show how telecoms providers compare on a range of measures of network performance and customer service. By providing clear and accessible information on how providers differ in terms of service quality, Ofcom expects the report to help consumers make more informed decisions about the services they choose. In turn, we expect this to act as an incentive for providers to raise their standards.

Regulatory framework

- 2.40 This consultation sets out our proposals to make specific directions under the SMP conditions that we have proposed to impose as part of our 2016 NMR Consultation and the March 2017 WLA Consultation in order to address BT's SMP position. In this consultation we are also proposing to make some consequential amendments to the SMP conditions we proposed as part of the 2016 NMR Consultation. Ofcom's duties and powers in relation to the carrying out of market reviews and the analytical framework that it applies are set out in 2016 NMR Consultation Section 2 and Annexes 10 and 11 and the March 2017 WLA Consultation Volume 1, Section 2 and Annexes 5 and 6.

Impact Assessment and Equality Impact Assessment

- 2.41 The analysis presented in this document constitutes an impact assessment as defined in section 7 of the Act.
- 2.42 Impact assessments provide a valuable way of assessing the options for regulation and showing why the chosen option was preferred. They form part of best practice policy-making. This is reflected in section 7 of the Act, which means that, generally, we have to carry out impact assessments in cases where our conclusions would be likely to have a significant effect on businesses or the general public, or where there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out impact assessments in relation to the great majority of our policy decisions.²⁸
- 2.43 Ofcom is required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. EIAs also assist us in making sure that we are meeting our principle duty of furthering the interests of citizens and consumers regardless of their background or identity. Annex 12 of the 2016 NMR Consultation and in Annex 7 of the March 2017 WLA Consultation set out our EIAs in relation to our proposals.

²⁷ Ofcom, 2017. *Automatic Compensation: Protecting consumers from quality of service problems – Consultation* ('2017 Automatic Compensation Consultation').
https://www.ofcom.org.uk/_data/assets/pdf_file/0030/98706/automatic-compensation-consultation.pdf.

²⁸ For further information, see Ofcom, 2005. *Better Policy Making: Ofcom's approach to Impact Assessment*, https://www.ofcom.org.uk/_data/assets/pdf_file/0029/45596/condoc.pdf.

Structure of this consultation

2.44 This consultation begins by outlining our approach to QoS remedies (Section 3), which describes how we have identified the scope of our regulation and the analytical approach we have taken in reaching our proposals. We then provide:

- an overview of market developments and our proposals in relation to fault rates (Section 4);
- proposals for regulating BT's service performance for repairs (Section 5);
- proposals for regulating BT's service performance for installations (Section 6);
- proposed transparency obligations (Section 7); and
- proposed remedies and legal tests (Section 8).

2.45 In addition, throughout this document we rely on information presented in the following Annexes:

- we set out our proposals for forecast fault rates (Annex 5);
- we provide a detailed review of Openreach service performance (Annex 6);
- we describe our approach to estimating the impact on Openreach resources of requiring higher service standards (Annex 7); and
- we include a report from our external advisors Analysys Mason on the design of the cost model (Resource Performance Model) we have used to estimate the resource impact noted above (Annex 8).

Disclosure of the Resource Performance model

2.46 We have developed, in collaboration with our external advisors Analysys Mason, a Resource Performance Model that estimates the installation and repair performance for a given size of field engineering force and installation and repair workload. We plan to make this Resource Performance Model available on request in the near future. Further details of the model and the computing environment required to run it may be found at the end of Annex 7 Resource implications of proposed performance standards.

Section 3

Approach to regulating quality of service

Introduction

- 3.1 In this section, we explain why it is necessary to regulate Openreach's quality of service for fixed voice and broadband services. We then outline our proposed approach to regulating quality. We set out our provisional view that:
- service standards should be our main tool to regulate Openreach's quality of service, but there is a continuing role for SLAs, SLG payments, and transparency obligations;
 - service standards should apply to installation and repair times of WLR, MPF and GEA-FTTC services; and
 - in setting the level of the standards, we will take into account the following considerations: (i) impact on customers and competition, with a focus on providing certainty; (ii) Openreach's operational capabilities; and (iii) costs to customers and telecoms providers.

The need to regulate for quality of service

- 3.2 We have provisionally found that BT has SMP in the wholesale fixed access markets (see 2016 NMR Consultation and March 2017 WLA Consultation) and that it is necessary to regulate access to BT's network to address the potential competition problems.
- 3.3 One of the consequences of BT having SMP is that it may not provide the quality of service that customers require. In competitive markets, the ability of customers to switch providers creates a signal for those telecoms providers to choose a cost-quality trade-off that will suit its customers. However, in the case of the wholesale fixed access markets, Openreach is unlikely to receive such signals, as customers generally cannot switch to alternative networks. Moreover, the lack of competitive pressure may result in Openreach having little incentive to innovate to find ways of improving quality of service. In addition, there is the potential for discrimination issues if Openreach were to provide BT divisions with better quality of service than it provides to other (non-BT Group) telecoms providers.
- 3.4 As set out in our March 2017 WLA Consultation, the negative effects on customers of inadequate quality of service delivered by Openreach include a greater number of faults, slow resolution of those faults and frustration resulting from long delays to the installation of fixed broadband and voice services. Inadequate Openreach quality of service also has the potential to undermine the effective functioning of the network access remedy due to the negative impacts on retail competition by, among other things, affecting switching behaviour. For example, long or uncertain waiting times for a provision or repair may discourage switching with consequent implications for retail competition.
- 3.5 Therefore, as part of the wholesale fixed access market reviews, we consider that regulation of quality of service is needed to deliver the quality customers require and ensure that the network access remedy facilitates effective downstream competition.

Tools for regulating Openreach quality of service

- 3.6 In broad terms, we have used three tools to encourage Openreach to provide an appropriate level of quality of service. These are transparency measures, SLAs/SLGs and regulatory quality standards. Below, we set out our proposed approach to using each of these tools in the forthcoming review.
- 3.7 In addition, we expected that the requirement that BT provide access to its network on an Equivalence of Inputs (EOI)²⁹ basis would lead to the quality demands of BT divisions being replicated for all Openreach's wholesale customers. In practice, we have found Openreach's performance to be equivalently poor.

Transparency measures

- 3.8 As set out in Volume 1, Section 3 of our WLA Consultation, BT, as a vertically integrated operator, has the ability and incentive to favour its own retail businesses by offering more favourable terms which would give it a competitive advantage over other telecoms providers and have a material adverse effect on competition. This discrimination could take the form of variations in quality of service - for example, Openreach could repair faults for BT Consumer more quickly than for external telecoms providers. Transparency measures, such as the obligation to disclose detailed Key Performance Indicators (KPIs), can help ensure that network access is provided on fair and reasonable terms by making it easier to identify such discrimination.
- 3.9 The disclosure of detailed KPI data to Ofcom also allows us to monitor important aspects of Openreach's service closely and observe trends in performance over time. This means we can assess performance for the services and quality aspects that will be subject to the quality standards. We can also monitor performance for services and quality aspects outside the scope of the quality standards, encouraging Openreach to focus on delivering on all its quality on a wide range of features (not only those covered by standards). This means we can detect potential concerns early and react quickly by, for example, using direction making powers to set additional regulation.
- 3.10 In the 2014 FAMR, we required Openreach to provide Ofcom with a number of KPIs and to publicly disclose a subset of those. This helps transparency by allowing all interested parties to understand the underlying service that telecoms providers are receiving. It also helps avoid differences in service quality between providers that rely on the same Openreach wholesale services.
- 3.11 While KPIs can be used to resolve information asymmetries and to observe trends in performance, on their own they are unlikely to be sufficient to prevent a dominant operator from exploiting its SMP by, for example, providing inadequate quality of service. Therefore, we also consider other regulatory measures are also necessary.

SLAs/SLGs

- 3.12 Service Level Agreements (SLAs) set out Openreach's commitment to provide services to an agreed quality, e.g. the target time to undertake a repair or installation.

²⁹ EOI means that Openreach must provide exactly the same products and services to all telecoms providers (including its own downstream divisions) on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information.

Service Level Guarantees (SLGs) specify the level of compensation that the telecoms provider would be entitled to should the service not be provided to the quality specified in the SLA, e.g. if delivery of the service was late. They are intended to reflect a pre-estimate of the average costs to a telecoms provider of breaches of the quality obligations specified in the SLAs. SLAs and SLGs are set in contracts agreed between Openreach and telecoms providers but can be influenced by regulation.

- 3.13 We have reviewed our policy in relation to whether compensation payable under BT's contracts for providing regulated wholesale network access services should be capped. We previously considered this question in some detail in 2008 when we looked at whether Openreach SLAs and SLGs were set appropriately to ensure that Openreach has the incentive to provision and repair services promptly.³⁰
- 3.14 Compensation caps are intended to limit liability in any given case and therefore compensate the supplied party to the level specified. The commercial practice for suppliers to limit their exposure by capping the amount of compensation that they would contractually be obliged to pay in the event of service failure is not uncommon, however some commercial contracts do include open-ended arrangements. We have approached the issue of capping compensation in different ways in the past and maintain the conclusion we reached in 2008, that it is not appropriate to adopt a general principle as regards the appropriateness of compensation caps but to consider the particular circumstances.
- 3.15 In this review of key wholesale services which underpin the mass market supply of fixed voice and/or broadband services of increasing importance to people's daily lives, we consider that the justification for retaining caps on compensation is weak, even where these caps are set to only capture the most extreme cases. The fact that compensation ceases once the cap is reached seems unlikely to reflect telecom providers' losses accurately, which might be expected to continue increasing until the service failure is rectified. The incentive properties to install or repair services thereafter diminish leaving a proportionally small but still a significant number of customers vulnerable to very long delays. In Sections 5 and 6 we examine the proportions and numbers of repair and installations which remain outstanding beyond the current 60 day cap on compensation.
- 3.16 Prior to 2014, we relied on SLAs/SLGs (in addition to the regulatory obligations of transparency measures and EOI) to ensure Openreach provided adequate quality of service. However, in the 2014 FAMR we decided that these measures on their own did not provide Openreach with sufficient incentives to maintain adequate levels of quality. In particular, we said that given the cost of maintaining a workforce to meet reasonable contingency levels, it was not apparent that SLG payments could be set at a level that would, on their own, ensure appropriate service standards.³¹
- 3.17 In the coming review period, we are separately proposing to introduce an obligation for telecoms providers to pay customers compensation for service failures associated with broadband and voice installation and repairs (automatic compensation)³². We expect that, in due course, Openreach's SLGs will also need to cover the costs to

³⁰ Ofcom, 2008. *Service Level Guarantees: incentivising performance*.
<https://www.ofcom.org.uk/consultations-and-statements/category-2/slg>.

³¹ Ofcom, 2014. FAMR Statement, paragraphs 11.32-36.

³² Ofcom, 2017. Automatic Compensation Consultation.

telecoms providers of paying automatic compensation due to Openreach network failures.

- 3.18 Automatic compensation could influence Openreach's incentives to provide better quality for two reasons. First, if SLG payments increase the financial penalties to Openreach of not providing quality would be higher. In addition, BT Group level incentives to provide high-quality service should increase, as low quality on the Openreach network could feed through to automatic compensation being paid by BT's retail divisions.
- 3.19 At this stage the introduction of retail automatic compensation is under consultation and its impact on SLGs is yet to be seen. For instance, possible changes to the SLA/SLG regime may only come into force midway through the review period, as there is a proposed implementation period of 12 months from the date of the statement.³³ In addition, the degree to which higher SLGs may affect BT's incentives remains uncertain.

Quality standards

- 3.20 Whereas SLGs are an obligation for Openreach to pay compensation to telecoms providers at the individual activity level (e.g. for each repair or provision where Openreach has not met the SLA), quality standards apply to Openreach's performance at the aggregate level over a defined period with the aim of ensuring that quality is maintained at a sufficiently high level to prevent material detriment to competition and customers.
- 3.21 In the 2014 FAMR Statement, we concluded that such standards were necessary to bring about improvements in Openreach's quality of service to safeguard against the network access remedy from being undermined. Openreach risked exposure to significant financial penalties and reputational damage if it failed to meet the standards. We note that these have been effective in stabilising Openreach's quality performance, although repair performance has not yet returned to 2009/10 levels.
- 3.22 However, we also expected Openreach to significantly exceed the standards, but in the case of repairs, this did not happen. This suggests that other regulation such as SLGs and transparency measures have had a limited effect in providing Openreach with incentives to perform beyond the standards. There is therefore a risk that Openreach will seek to perform only at the level of the standard set, such that it becomes a 'ceiling' for performance, rather than a 'floor'. As discussed above, our proposed automatic compensation regime may increase Openreach's incentives to outperform the standards, but there is still uncertainty about this.
- 3.23 A further benefit of quality standards is that if they are set at a sufficiently demanding level they give telecoms providers certainty about the level of quality they can expect from Openreach. This contrasts with the SLA/SLG regime, which provides compensation if a specific installation or repair is not dealt with in a timely manner, but gives little assurance to telecoms providers over what will actually be achieved. We believe that certainty over the speed of repairs and installations plays an important role in the functioning of retail competition. It allows telecoms providers to plan their strategies for delivering retail services and differentiating their products effectively. We consider the role of certainty further when we consider the appropriate level of standards below.

³³ Ofcom, 2017. Automatic Compensation Consultation, page 74.

Provisional conclusion on tools to regulate Openreach quality of service

- 3.24 Transparency measures, SLAs/SLGs and quality standards serve different purposes but work in a complementary way. Quality standards provide a high degree of certainty over the aggregate level of service Openreach will achieve, and have proven effective at raising standards. KPIs help us monitor compliance with these standards and SLGs will provide compensation for individual Openreach service failures.
- 3.25 However, given that Openreach has not performed significantly beyond the 2014 quality standards in relation to repair in particular, and given the importance we attach to certainty in providing quality, in considering the balance between standards and other regulatory measures, we propose to place more weight on the role of standards.
- 3.26 We therefore intend to use quality standards as our primary tool for driving Openreach performance improvement.

Proposed scope of quality standards

- 3.27 This sub-section considers the appropriate scope for quality standards. First we consider the Openreach services to which we think the quality standards should apply. Second, we consider the quality features that should be covered by the quality standards.

Services covered by the proposed standards

- 3.28 In the 2014 FAMR we applied minimum standards to WLR and MPF services, but did not apply them to Openreach's superfast broadband service GEA. This was mainly because WLR and MPF services had been the focus of the concerns raised at the time and, because these copper-only based services were the highest volume services, so we concluded that they were likely to have the greatest impact on competition and customers more generally.
- 3.29 GEA has now developed into one of the core groups of services supplied by Openreach. The total number of GEA lines is now 7.25m (up from 3.23m at the start of the 2014 FAMR reporting period), and we understand that the installation and maintenance of these lines will be a key driver of engineering resource for Openreach over the next review period. Therefore, the quality of service delivered by Openreach for GEA services is now likely to have a significantly greater impact on the customer experience and will play an important role in the functioning of retail competition.
- 3.30 GEA is currently available in two variants: Fibre to the Cabinet (FTTC) and Fibre to the Premises (FTTP). FTTC represents the majority of GEA lines (about 1% of GEA lines were using GEA-FTTP at the end of 2016). Given the low volumes of FTTP we only propose to apply QoS standards to the FTTC variant of GEA.
- 3.31 We therefore propose that the quality standards for the next three years should apply to GEA-FTTC services as well as to WLR and MPF services. We consider that these proposals are consistent with our legal duties, specifically that WLR, MPF and GEA-FTTC are key services supporting network access.

Features covered by the proposed standards

- 3.32 In our Strategic Review, we received extensive responses from consumer groups, industry bodies and telecoms providers expressing concerns about Openreach's performance across several quality of service issues, including faults, repair times and installation times. Below, we consider these issues and their likely effects on customers, telecoms providers and retail competition.

Fault occurrence

- 3.33 As highlighted in several Ofcom studies, broadband services are increasingly viewed as a necessity by consumers and businesses. For instance, the 2016 Jigsaw focus group research found that many consumers and businesses view broadband as central to their home and work lives.³⁴ This is further illustrated by the 2017 Jigsaw survey which found that 66% of residential consumers believe their households would struggle to function without broadband and another 23% stating that they could only function without it for a limited period.^{35 36}
- 3.34 This suggests the loss of service when a fault occurs has the potential to cause considerable harm. For customers, there can be a range of harmful effects that differ depending on the precise nature of a fault. In addition to the unavailability of a service, there is the time spent reporting a failure as well as anxiety, frustration and distress they may experience due to the disruption to their daily activities. The possible types of harm are detailed in our consultation on Retail automatic compensation³⁷ and are summarised below in Table 3.1.

³⁴ Jigsaw Research, 2016. Quality of Service in telecoms: Residential consumer and SME experiences of quality of service in fixed line, broadband and mobile telecoms, page 13, https://www.ofcom.org.uk/_data/assets/pdf_file/0025/78370/jigsaw_quality_of_service_in_telecoms.pdf.

³⁵ Jigsaw Research, 2017. *Automatic compensation: Consumer experience of provisioning delays, loss of service and missed appointments: Presentation of quantitative findings*, Slide 16, https://www.ofcom.org.uk/_data/assets/pdf_file/0026/98711/automatic-compensation-jigsaw-report.pdf.

³⁶ Similarly, 59% of SMEs stated that their businesses would struggle to function without a broadband service, while 25% stated that their business could only manage for a limited period without it –Jigsaw 2017, Slide 72.

³⁷ Ofcom, 2017. Automatic Compensation, Annex 4.

Table 3.1: Types of harm that can result from a loss of broadband

Type of harm	Description
Denied use of a communications service	This is harm due to the denied use and enjoyment of a service that customers expected to have and the telecoms provider had committed to providing.
Costs of alternative services	When customers are unable to use their first choice of communications service they may seek an alternative to use during this period of unavailability. Some customers may already possess an alternative (e.g. a smartphone with a contract for minutes and data), whereas others may incur financial costs to get an alternative (e.g. use an internet café, purchase a dongle, or increase their bundle of mobile data).
Disruption in a customer's activity schedule	This is where a loss of service requires customers to rearrange their activities in a way which is overall detrimental to them. For example, a loss of service may prevent customers from being able to work or study from home.
Time and effort spent to rectify the failure	When a fault occurs, customers will need to spend time and effort to rectify the situation. This may include trying to fix the problem themselves (e.g. resetting a router), as well as reporting the issue to their providers and to follow-up on providers' responses (typically over the phone).
Wasted or impaired time	For a fault to be repaired, customers often need to stay at home to grant access to an engineer. This may result in harm if customers are not able to carry out other activities while they are waiting.
Stress and anxiety	Customers are likely to experience annoyance, frustration, distress or anxiety if the communication service they were expecting to receive from their communications providers does not meet the expected standards.

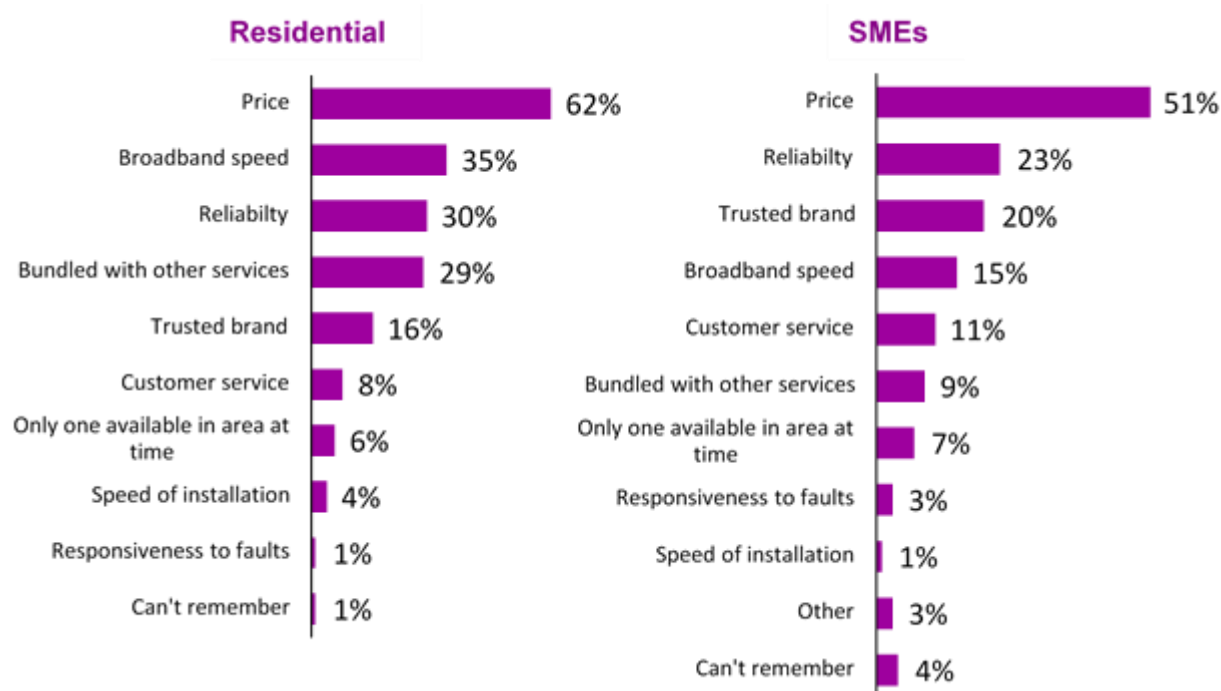
- 3.35 In our recent consultation on automatic compensation we estimated that the harm to customers from loss of service is worth £10 per day.³⁸ These estimates are based on consumer survey evidence, as well as a range of other evidence such as current compensation levels and selected sectoral and international benchmarks. While the evidence suggests a wide range of possible values for the harm due to loss of service, the magnitude of the estimates indicate that faults can lead to considerable customer harm.
- 3.36 Faults can also lead to harm due to the impact on telecoms providers' businesses. This harm can include the costs to telecoms providers of liaising with and compensating customers when a fault occurs. In addition, faults have the potential to undermine a telecoms provider's brand image and reputation for reliability. Such harm may result from faults on the Openreach network, as well as from faults on the telecoms providers' own networks – some customers may incorrectly attribute Openreach service issues to telecoms providers because the delineation between the responsibilities of telecoms providers and Openreach may not be obvious. Telecoms providers have highlighted the key role of reliability in meeting their

³⁸ Ofcom, 2017, Automatic Compensation, para A4.63

customers' expectations. For example, BT Consumer has carried out research which suggests customers expect broadband/ internet services that 'always work',³⁹ while Sky considers that reliability and service are key needs and pain points that affect customers' brand choice.⁴⁰

- 3.37 Openreach network faults also have the potential to harm retail competition due to its effects on switching. As shown in Figure 3.2 below, the 2017 Jigsaw survey found that, when choosing a broadband provider, reliability was the third most important factor for residential customers (after price and broadband speed) and was the second most important factor for small and medium sized enterprises (SMEs) (after price). Harm to retail competition may occur if customers who have experienced an Openreach fault decide to switch based on the mistaken belief that the fault would not have occurred with another telecoms provider, i.e. it may lead to customers choosing the services that do not best meet their needs, and impose losses on telecoms providers over which they have no control.

Figure 3.2: 2017 Jigsaw survey – main factors that influenced choice of broadband provider (Slide 18 for residential and Slide 76 for SMEs)



C2a/b/c Thinking back to when you chose your (service), what were the main factors that influenced your choice of provider?

Repair Timescales

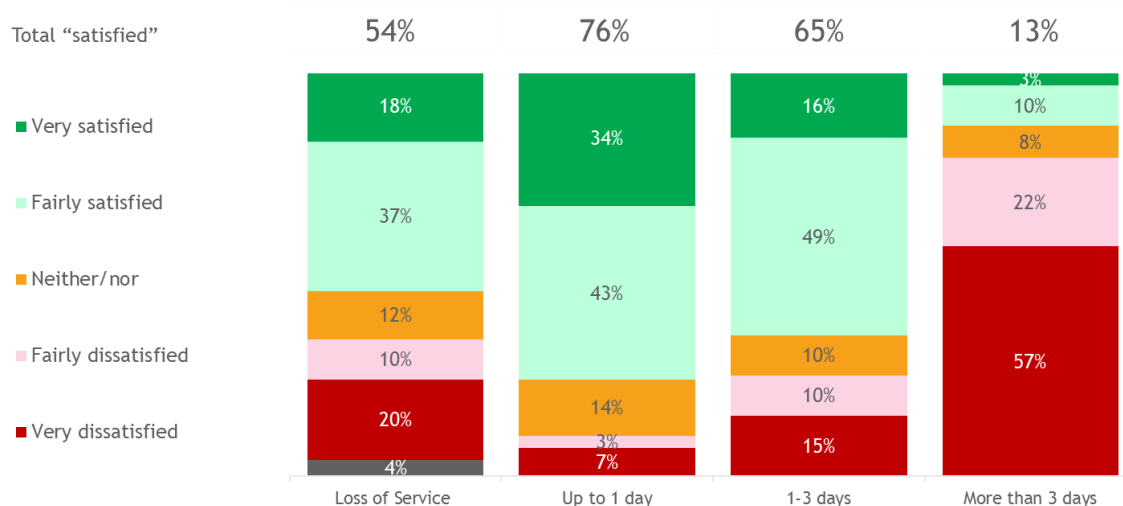
- 3.38 The length of time taken to restore service (i.e. the repair time), as well as fault rates, have a significant impact on customers and competition. This is supported by the 2017 Jigsaw survey which indicated that, although overall the majority (54%) of customers who had a loss of service were satisfied with their telecoms providers' ability to resolve the problem, dissatisfaction increased considerably as the length of

³⁹ BT Group presentation received by Ofcom on 16 November 2015, "Customer Demand and our Fibre Strategy – GPLC(14)68", Slide 11, received in response to 1st WBA s.135 request of 8 October 2015.

⁴⁰ Sky presentation of 9th June 2016, "Ofcom QoS Meeting", Slide 4.

time to restore service increased. This is shown in Figure 3.3 below, where around 10% of respondents said that they were dissatisfied with their service being restored up to one day after first notifying their provider. This figure rose to 79% when the service took more than three days after notifying the provider for it to be restored. These findings are consistent with the 2016 Jigsaw focus group research which found that how long it takes to resolve quality of service issues has a major bearing on customers' overall perceptions of the experience.⁴¹

Figure 3.3: 2017 Jigsaw survey – Satisfaction with provider ability to resolve loss of service, by how long it took for your service to be restored after first notifying the provider (Slide 36)⁴²



F6 Overall, how satisfied or dissatisfied were you with the length of time it took your provider to resolve your loss of service for your (service), using the following scale?

- 3.39 The survey evidence indicates that there is some willingness to pay for faster repair times than the times that are currently being provided. The 2017 Jigsaw survey found that 44% of residential customers said they were willing to pay a one-off payment of £5 to have service restored in one day instead of two days.⁴³ However, the evidence also suggests a broad range of preferences among customers, with some customers being willing to accept a lower bill in return for a slower repair time. For example, the 2017 Jigsaw survey found that 50% of residential customers are willing to accept a repair within three days (instead of two days) for £5 off the next bill.⁴⁴

Installation issues and timescales

- 3.40 In terms of installations, issues such as prolonged lead times and missed or postponed engineer appointments have the potential to result in negative experiences for consumers. These range from annoyance due to delays to more serious emotional consequences and disruption when customers are left without working services and/or when they need to get directly involved in sorting out issues (e.g. contacting their telecoms provider to reschedule an engineer visit).⁴⁵

⁴¹ Jigsaw Research, 2016, Section 4.2

⁴² The 4% under loss of service refers to those that have responded "don't know" or "not applicable".

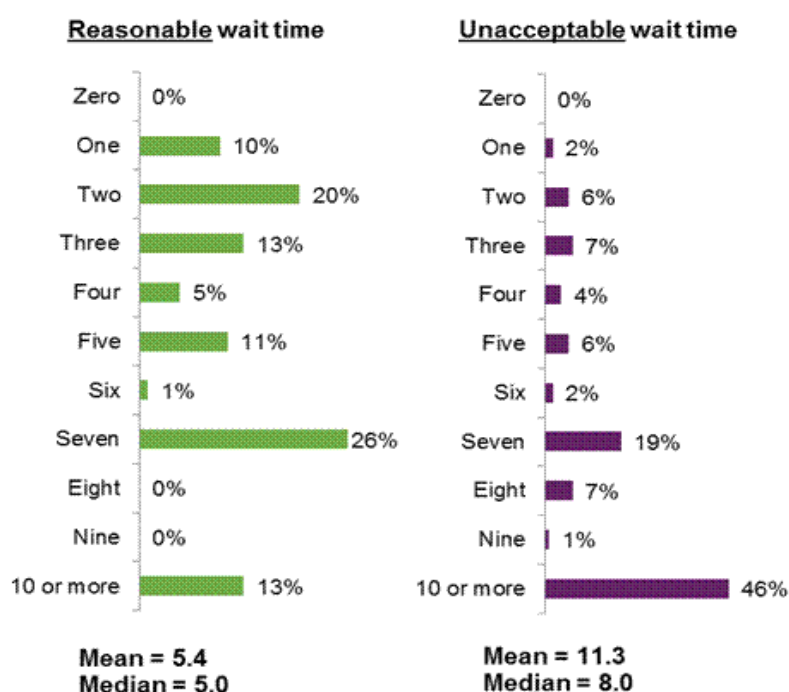
⁴³ Jigsaw Research, 2017, Slide 124.

⁴⁴ Jigsaw Research, 2017, Slide 124.

⁴⁵ Jigsaw Research, 2016, Section 5.1

- 3.41 Problems during the installation process can also have negative effects on telecoms providers and competition. For example, in response to our Strategic Review, telecoms providers highlighted the concern that lengthy Openreach installations can result in customers being reluctant to switch providers and consequently not purchasing services that best meet their needs. Sky, for example, argued that lengthy installations can result in customers cancelling switches that are already in progress, choosing not to switch when informed of provisioning lead times, or being deterred from initiating a switch due to a previous bad experience.⁴⁶
- 3.42 The 2017 Jigsaw survey indicates that most residential customers consider a wait of up to seven days for an installation appointment to be reasonable and a wait of ten days or more to be unacceptable (see Figure 3.4 below). These findings suggest that, where installations are taking ten days or more, dissatisfaction is higher and more customers may reconsider their switching decisions, e.g. abandoning their switch altogether or deciding to switch to another provider.

Figure 3.4: Customer expectations for installation appointment times for a new fixed line broadband service or landline service (calendar days) (Slide 121)



C1/C1h Please think back to when you experienced [E1a] for [fixed line/BB]. How long do you think it would have been reasonable to wait until the first suitable appointment for an engineer to visit? Reasonable' does not have to mean your 'ideal' situation, but one that would be generally satisfactory to you. Please give your answer in terms of calendar days. C2 And what would be an unacceptable length of time to wait? Please give your answer in terms of calendar days [per] landline/broadband installation.

- 3.43 The consumer research we have gathered indicates that some customers would be willing to pay to receive a faster installation – the 2017 Jigsaw survey⁴⁷ found that 36% of customers would pay £5 more to receive an installation within ten days rather than within 12 days. However, as with repair times, other customers are more price

⁴⁶ Sky first response to our Strategic Review, paragraphs 46-49.
https://www.ofcom.org.uk/_data/assets/pdf_file/0024/52287/sky.pdf.

⁴⁷ Jigsaw Research, 2017, slide 122.

sensitive with a similar proportion (41%) stating they would accept an installation within 14 days instead of 12 in return for £5 off their next bill.

Proposal for quality features subject to standards

- 3.44 We consider it appropriate to continue to set standards on repair times. The discussion above highlights the importance of repair times to customers and telecoms providers. Moreover, repair standards have proven effective in raising Openreach's performance on repair times. They also have the advantage of being easily measurable – it is clear to industry and to Ofcom what constitutes success and failure, and there are precedents to follow when assessing the costs to Openreach of increasing performance.
- 3.45 Based on the evidence summarised above, fault prevention is also likely to be a key issue for consumers and competition. A possible regulatory response might be to apply standards to the level of faults. We believe, however, that given our competition concerns relating to network access, even with a control on fault rates, we would need regulation that protects customers from waiting for an excessive time for Openreach to repair faults. We believe the standards we propose for repairs create a strong incentive to reduce the overall level of faults, supported by our proposals to reduce the allowance for repair activity in the charge control, which we set out in Section 4. This is because we believe one cost effective way for Openreach to meet the provision and repair quality standards would be through saving costs by reducing fault rates. The current minimum standards may already have heightened Openreach's focus on fault prevention - following our Strategic Review, Openreach initiated its 'network health' programme, which aims to reduce its annual fault rate from 11% by at least 10% – i.e. to less than 9.9%.
- 3.46 Furthermore, it may not be possible to set an effective control on faults, due to the following factors:
- Assessing the costs of quality standards on faults may require us to identify exactly how Openreach should target its network investments to achieve an optimal quality outcome. This would be challenging without detailed knowledge of the health of Openreach's network, which is not easily achievable in the context of a market review process.
 - There may be challenges in measuring compliance with standards on faults. Due to the wide range of issues that can lead to faults (as set out in Section 4), there may be asymmetries in information between Openreach and telecoms providers as to the nature and source of faults. Thus, detailed investigations may be required to determine whether a fault has occurred and whether the source of the fault is on the Openreach network or lies within the area of the telecoms provider's responsibility.
 - Openreach's past performance indicates that faults are highly sensitive to exogenous factors such as weather. This means that it may be necessary to set the levels of fault standards using wide ranges or by including a large *force majeure* allowance. Considering such factors therefore risks designing standards that are so broad that they would not exert a meaningful level of control on Openreach's performance or that may include an unworkable number of exceptions.
- 3.47 In the light of this and the implementation challenges set out above, we are not proposing to impose a further standard on fault rates. In reaching this view, we have

considered the expected impact of the other regulatory measures we are proposing on Openreach's fault rate. These include, for example, our proposal to set the charge control using our best estimate of the efficient fault rate (as set out in Annex 5). This measure is aimed at increasing transparency by being clear about what our best estimate of what an efficient fault rate is and ensuring that BT is not recovering the costs of inefficiently high levels of repairs.

- 3.48 We consider it appropriate to continue to set standards on the timeliness of installations. The evidence above suggests that customers' experience of the installation process is a key consideration when making switching decisions. Standards on installations can therefore help support the network access remedy by providing telecoms providers with the certainty they need to communicate effectively with their customers and provide services within timescales that meet their needs.
- 3.49 We note above that missed appointments can lead to poor customer experiences; however, the evidence presented in Annex 6 indicates that Openreach has improved its performance in this regard, and we do not see a role for additional regulation at the current time, given the strengthened incentives to address this type of failure through our proposals for the timeliness of repairs and installations.

Summary of proposals for scope of quality standards

- 3.50 Based on the above, we propose that our quality standards should apply to repair and installations times of WLR, MPF and GEA-FTTC.

The appropriate levels of the quality standards

- 3.51 Our Strategic Review sets out our regulatory objective of delivering a step change in the quality of service provided by Openreach, reflecting the increasing importance of broadband services to consumers and businesses (demonstrated by the evidence above). We think this needs to be reflected in the quality standards that we set, as these are our primary tool for driving improvements, and we are not confident that SLGs will incentivise performance beyond the current level of performance.
- 3.52 We therefore intend to set higher standards in this review. This contrasts with our approach in 2014 where it was the first time we had set quality standards and Openreach needed to improve its quality from a very low base. We reflected the operational challenges of improving quality of service in the levels set.
- 3.53 In setting the exact standard, we propose to consider the benefits to telecoms providers and competition as well as the implementation challenges and costs involved in raising standards.

Benefits to customers and telecoms providers

- 3.54 Setting higher standards on repairs and installation times provides direct benefits to consumers and telecoms providers because both parties spend fewer days waiting for a repair or an installation. In addition, as set out above and in Section 5, we believe that more challenging repair standards are likely to lead to stronger incentives on Openreach to reduce faults, which will in turn lead to further benefits to telecoms providers and customers.
- 3.55 We outlined evidence on the extent of these benefits above. We recognise that it is difficult to measure such benefits precisely, particularly given the limitations of survey evidence and the forward-looking nature of the review. However, the range of

qualitative and quantitative evidence provides us with a broad understanding of the importance of service quality.

- 3.56 Quality standards also provide more certainty over the level of service that will be received from Openreach. Having a sufficient degree of certainty over the speed of repairs and installations is important in the functioning of retail competition. It allows telecoms providers to plan their strategies for delivering retail services. For example, in terms of installations, TalkTalk has stressed the importance of Openreach quality of service being good enough to allow TalkTalk “to deliver a high quality of service at all times and take measurements to ensure that we always meet this standard”.⁴⁸ This in turn provides benefits for consumers.
- 3.57 We think that it is important that Openreach meets any target repair or installation time in a very high proportion of cases. As a rule of thumb, we consider that a standard of at least 90% is necessary to provide telecoms providers with a sufficient degree of certainty. At levels below this, Openreach can miss the target set – by a potentially large extent – more than one in ten times that it provides a service and we do not consider this to represent fair, reasonable and timely network access. The higher the level of performance Openreach can consistently achieve above this (i.e. the closer to 100%), the more certainty the target provides.

Openreach’s operational capabilities

- 3.58 We will also consider Openreach’s technical capabilities to make improvements and the time it will take to achieve them. It is unlikely to be economically efficient or even practically possible for Openreach to meet its SLAs 100% of the time. This is because certain jobs require complex civil engineering work and can only be done within the SLA at very high cost, if at all. In addition, as detailed in Section 5, the inherently volatile and unpredictable nature of fault and installation volumes makes it difficult to eliminate field resourcing failures.⁴⁹
- 3.59 We propose to set standards that are stretching enough to drive Openreach to make improvements, but that are not so high that they are unachievable. We also take into account the additional engineering resources Openreach may need to recruit, and the time required for Openreach to achieve those staffing levels and for the newly recruited or retrained engineers to become competent. This is particularly relevant in our proposals for the period of time over which the quality standards will increase.

Costs to customers and telecoms providers

- 3.60 We would be concerned if higher quality standards led to materially higher prices for customers as our evidence indicates that value for money is an important factor for many customers. For instance, the 2017 Jigsaw survey indicates that price, as well as quality of service, is an important factor for customers when choosing a telecoms provider for broadband services (see Figure 3.2 above).
- 3.61 However, the 2017 Jigsaw survey also showed there was a wide range of preferences among consumers, with some willing to pay a premium for faster repairs and installations and others being more price sensitive (as set out above).

⁴⁸ Meeting between TalkTalk and Ofcom on Quality of Service, dated 19 November 2015, Riverside House

⁴⁹ As set out in Section 5, field resourcing failures occur when the workload (volume of repairs and installations) exceeds the field engineering resource planned to be available on any given day.

- 3.62 Telecoms providers have a choice over the standard of quality they purchase from Openreach. In particular, in relation to repairs, Openreach supplies products with differing SLA commitments on repair times (referred to as 'service maintenance levels' or 'SMLs'). This means that telecoms providers can select the price/quality trade off most appropriate to their customers.
- 3.63 Thus, while we want to ensure that our proposals do not impose unavoidable costs on telecoms providers and customers that are out of line with the benefits they receive, telecoms providers should be free to choose the standards they require for their consumers themselves. However, we believe that telecoms providers require a high degree of certainty over the quality they receive if they are to make a meaningful choice between different service levels. We believe that the best way to provide them with this certainty is by setting quality standards which require Openreach to meet a target level of quality a high proportion of times.

Question 3.1: Do you agree with our proposals regarding our approach to quality of service remedies. Please provide reasons and evidence in support of your views.

Section 4

The customer experience of network reliability

Introduction

- 4.1 Section 3 identifies Openreach fault rates (the average incidence of faults in Openreach's services each year) as key to the quality of the network access remedies in the narrowband and WLA markets. Faults play an important role in customers' experience of broadband and telephony services and drive the costs of these services. The higher the incidence of faults, the more Openreach must spend to maintain the network. This, in turn, has the potential to lead to higher prices if Openreach is to recover its efficiently incurred costs.
- 4.2 This section is structured as follows:
- Firstly, we review customers' experience of broadband and telephony faults. We examine the contribution made by retail telecoms providers to customer-reported faults and then look in more at about the contribution that Openreach's services make to customers' experience. We examine:
 - the Openreach fault rate which relates to cases where services fall short of the technical specifications for Openreach's services and which are repaired in-tariff (in other words the repair activity is included in the rental charge telecoms providers pay to Openreach); and
 - out-of-tariff repair activities which relate to the repair of certain 'line impairments' and customer wiring issues that fall outside the technical specification of Openreach's services and for which Openreach levies per-event charges over and above rental charges.
 - Secondly, we review Openreach's investments in preventative maintenance. We then consider how best to ensure that Openreach makes efficient investments to optimise fault rate outcomes for customers.
 - Finally, we review recent developments which enable 'out-of-tariff' faults to be identified more easily with remote diagnostic tests. We then consider how Openreach and telecoms providers can maximise the potential benefits of these developments for customers.

Summary of our proposals

- 4.3 We find that Openreach has [£<] investment in preventative maintenance in recent years. It plans to invest more over the coming years to reduce the level of faults. We also find there has been a prolonged period of reduced total capital expenditure by Openreach (Table 4.5); we consider there is a risk that network reliability may diminish because of underinvestment. We want to ensure that Openreach follows through with its planned investment in 'network health'. To achieve this, we are proposing the following:

- to set higher quality standards for fault repairs, which in turn should provide stronger incentives for Openreach to invest in preventative maintenance to reduce the volume of faults;
- to decrease the repair operating expenses (opex) costs that we allow Openreach to recover through its regulated charges consistent with its stated intention to reduce fault volumes;⁵⁰ and
- not to increase the capital expenditure (capex) allowance in the charge control, as the steady state on-going network approach provides sufficient funding for Openreach to implement its planned investment in 'network health'.

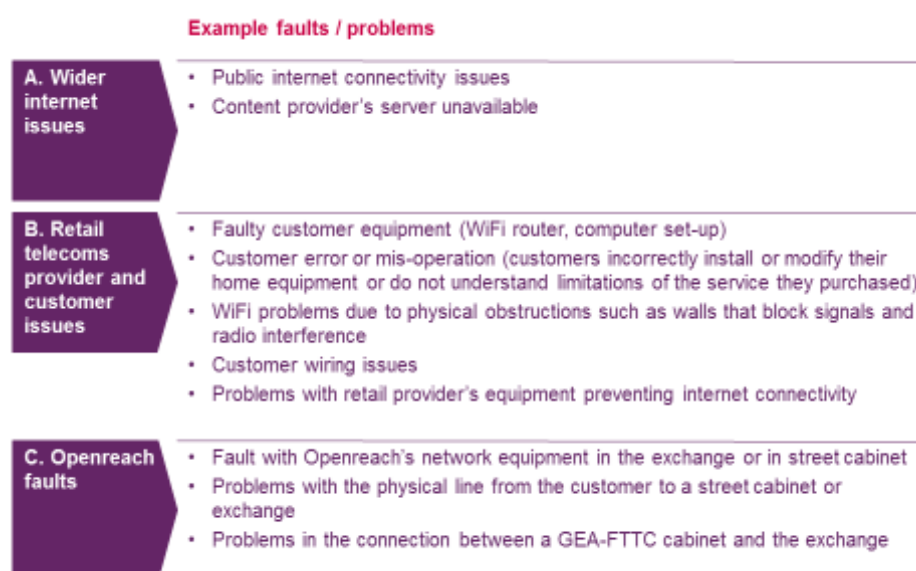
4.4 We find that recent developments may significantly improve Openreach's ability (and, by extension, that of telecoms providers) to remotely diagnose certain line impairments and customer wiring issues which are currently repaired as out-of-tariff repair activities. Given the potential benefits for customers, we think there is a strong case for Openreach and telecoms providers to continue with these developments and to integrate them fully into operational processes to realise their potential. We have asked the Office of the Telecommunications Adjudicator (OTA2) to provide such assistance as is required. We also intend to monitor progress and will consider informal or formal intervention if we consider that customer benefits have not been realised.

Customers' experience of faults

Faults experienced by customers can be due to a wide range of causes

4.5 Telecoms services rely on contributions from multiple parties, and consequently responsibility for clearing faults also lies with different parties. Figure 4.1 below provides an illustration for broadband services.

Figure 4.1: Causes of broadband faults and responsibility for fault repair



⁵⁰ We set out our proposed forecast for fault rates in Annex 5, and use this forecast as an input to our charge control modelling, which is shown in the March 2017 WLA Consultation Annex 11.

- 4.6 While the list above is not exhaustive, it illustrates that Openreach's services are one of many contributors to customers' service experience.
- 4.7 Importantly, some of these contributors are outside the direct control of retail telecoms providers and Openreach. Thus, when a customer experiences a problem watching a video on BBC iPlayer, the problem might relate to the iPlayer server, the customer's computer, internal wiring or WiFi rather than the retail telecoms service or the underlying wholesale service provided by Openreach. Retail telecoms providers therefore have a particularly important and challenging role in identifying customer service problems and advising on the best course of action for resolving these.
- 4.8 Our qualitative research found that this interaction is critical to the customer experience. Empathetic and professional handling of the customer at this point, and minimising the need for repeat calls, or for the customer repeating information or tests, were factors our panels identified as characteristics of excellent service.⁵¹
- 4.9 Service quality is clearly an issue that the entire industry needs to address. We note with concern that in 2016 telecoms is once again ranked below utilities as the worst sector in the Institute for Customer Service's annual league table.⁵²

Our analysis suggests that retail telecoms providers clear a significant proportion of fault reports without referral to Openreach

- 4.10 To gain a better understanding of the contribution that telecoms providers make to customers' experience of retail telecoms services, we sought information from telecoms providers concerning the volume of faults reported to them by customers and the proportion of faults subsequently referred to Openreach.
- 4.11 The information proved difficult to acquire on a consistent basis and should therefore be treated with caution.⁵³ It does however, provide some useful insights concerning the proportion of faults that retail telecoms providers clear and the proportion that they pass to Openreach for repair as summarised in Table 4.2 below.

⁵¹ Jigsaw Research, 2016, pages 18-19.

⁵² Institute of Customer Service, 2017, UK Customer Satisfaction Index,. <https://www.instituteofcustomerservice.com/research-insight/research-library/ukcsi-the-state-of-customer-satisfaction-in-the-uk-january-2017> [accessed 17 March 2017].

⁵³ We first attempted to gather this information in July 2016 using our formal powers. Responses to our draft notice under Section 135 of the Communications Act sent to 9 telecoms providers indicated that most of the telecoms providers were unable to respond. We then approached 6 telecoms providers with an informal request seeking less detailed information. We subsequently received confidential responses from 4 telecoms providers (3<4). The information provided varies in the level of detail and time periods covered, and in the definitions used. There were also some apparent inconsistencies in the information.

Table 4.2: Proportion of faults received by telecoms providers that are cleared by them or passed to Openreach

Telecoms provider	Cleared by telecoms provider	Passed to Openreach for resolution
[X]	47%	48%
[X]	20% to 78%	80% to 22%
[X]	49% to 69%	51% to 31%

Source: Ofcom analysis of information by telecoms providers. Ranges reflect variation between services.

- 4.12 Table 4.2 shows that the three telecoms providers all clear a significant proportion of the faults reported to them without referral to Openreach⁵⁴. Two of the providers reported that the proportion of faults cleared internally varied significantly by product.
- 4.13 As we have information from only three telecoms providers, it is not possible to draw definitive conclusions about the overall proportion of faults cleared by retail telecoms providers. However, this information suggests that at least a significant proportion, and potentially the majority, of faults reported by customers relate to retail telecoms services, customers' equipment and home wiring, the internet and content services rather than to the wholesale services provided by Openreach. By extension, this information suggests that telecoms providers refer a significant proportion of customer fault reports to Openreach for resolution.
- 4.14 Table 4.2 is also consistent with anecdotal reports from other telecoms providers, which suggest that they typically clear around half of faults reported to them without referral to Openreach.

A significant proportion of fault reports may relate to customer equipment and wiring, the internet and content services

- 4.15 The information supplied by the telecoms providers does not allow us to determine what proportion of faults might relate to customers' equipment and wiring, the internet and content services rather than the retail and wholesale services within the direct control of telecoms providers and Openreach respectively. Anecdotally, we understand that retail telecoms providers typically clear a significant proportion of customer fault reports as 'right when tested' indicating that diagnostic tests of the retail and underlying wholesale services did not detect any problems and therefore the faults were likely related to the customers' equipment and wiring, the internet or content services.

Openreach's definition of a fault reflects the capabilities of its line test systems

- 4.16 Openreach's exchange based copper line test systems are currently the primary tools for diagnosing faults in Openreach's copper access network. While these tools generally work well, they were originally designed to detect faults that affect voice services.

⁵⁴ They may, however, make use of Openreach's remote diagnostic testing tools to diagnose faults.

- 4.17 There are inherent limitations to the basic electrical tests performed by this type of line test system which prevent them from reliably detecting certain line and customer wiring⁵⁵ conditions that can impair broadband performance.⁵⁶ These conditions can significantly impair the quality of the broadband service and typically:
- reduce the bandwidth of the broadband service below that previously available or expected; and/or
 - cause the broadband service to repeatedly ‘re-train’⁵⁷ causing service interruptions and potentially reducing broadband speeds.
- 4.18 The contractual arrangements and operational processes for Metallic Path Facility (MPF) and Shared Metallic Path Facility (SMPF) reflect these limitations.⁵⁸ Openreach maintains copper lines to a technical specification called SIN349⁵⁹ which reflects the capabilities of its exchange based line test systems. Diagnosis and repair of problems affecting broadband services which fall outside this specification (broadly, conditions which cannot be detected with Openreach’s exchange based line test systems) are treated as out-of-tariff activities and are chargeable activities unless the investigation uncovers a fault that falls within the SIN349 definition.⁶⁰
- 4.19 Out-of-tariff activities typically involve field engineering activities comprising a visit to the customer’s premises and often other parts of the access network to undertake further tests and investigations.

We need to examine out-of-tariff activities as well as Openreach fault rates to understand Openreach’s contribution to customers’ experience

- 4.20 Openreach’s fault rates as they relate to the core regulated services only include in-tariff faults. Out-of-tariff activities are excluded except in cases where an in-tariff fault was detected during the out-of-tariff activity. Moreover, telecoms providers have told us that rising customer expectations and increasing take up of superfast broadband products have led them to use out-of-tariff activities more often.⁶¹ As we discuss below, our analysis supports this view.

⁵⁵ Telecoms wiring within a customer’s premises beyond Openreach’s network termination point belongs to the customer and is not part of the service provided by Openreach.

⁵⁶ These line conditions include high resistance joints, imbalanced cable pairs, bridge taps (an un-terminated length of cable connected to a copper line). The customer wiring conditions include bridge taps and bell wire issues.

⁵⁷ When a broadband service is impaired due to a line problem, the modem will re-initialise the connection. This involves a handshaking process between the modem and DSLAM to establish the bandwidth that the line can support, during which service is interrupted.

⁵⁸ In practice, these limitations also apply to GEA-FTTC, as it is an overlay service that uses either MPF or SMPF.

⁵⁹ Suppliers Information Note 349 Issue 2.5 August 2015, <http://www.sinet.bt.com/sinet/SINs/pdf/349v2p5.pdf> [accessed 24 March 2017].

⁶⁰ Telecoms providers must either order a Special Faults Investigation 2 (SFI2), Broadband Boost (BBB) or Superfast Visit Assure (SFVA) package or use the Conscious Decision to Appoint (CDTA) or Conscious Decision to not Appoint (CDTNA) processes.

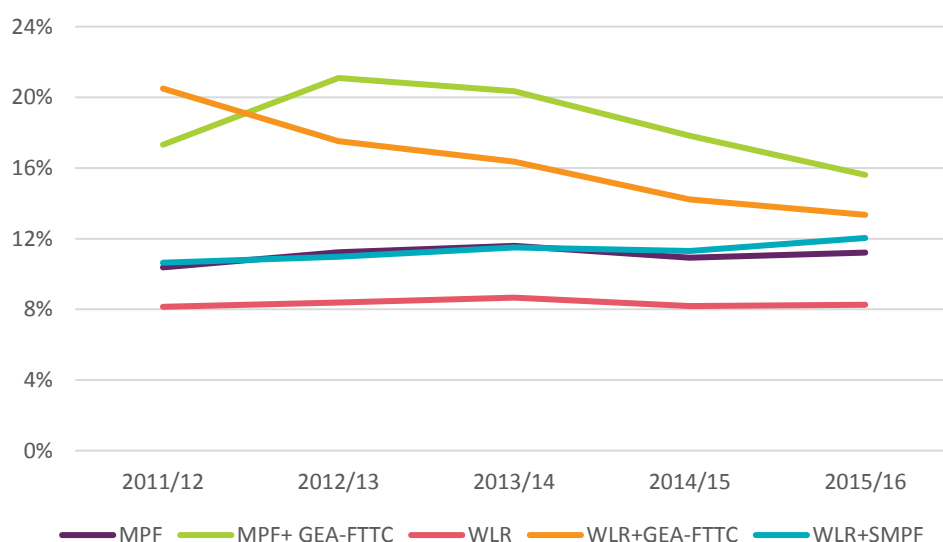
⁶¹ CDTA and CDTNA activities are also used to request Openreach to investigate faults that fall within the SIN349 definition but which cannot be reliably detected with Openreach’s exchange based line test systems. These include intermittent faults and noisy lines. We consider it likely that the increasing incidence of these activities has been driven by rising customer expectations of their broadband services.

- 4.21 Thus, to get a complete picture of Openreach's contribution to customers' experience of network reliability, we review Openreach's fault rate and the incidence of out-of-tariff activities below.

Openreach's fault rates are broadly stable

- 4.22 Openreach measures the frequency of faults, and the reliability of the Openreach network, through a fault rate. In broad terms the Openreach fault rate is the total incidence of faults that are repaired 'in tariff', as a proportion of the total number of customers per year.
- 4.23 In Figure 4.3 below we show the recent trends in Openreach's in-tariff fault rate, for the main services it provides for voice and broadband. GEA-FTTC and SMPF are 'overlay' services, which means they are not used on a standalone basis but rather together with a physical line such as MPF or WLR (the bearer service) so we show the fault rate for the combined service (i.e. MPF+GEA, WLR+GEA and WLR+SMPF).

Figure 4. 3: Annual Openreach fault rates, for each service type (proportion of lines experiencing a fault each year)



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the second QoS information request to BT of 25 May 2016

- 4.24 Figure 4.3 shows that overall, in-tariff fault rates for lines carrying standard broadband services (i.e. MPF and WLR+SMPF) have remained broadly stable at around 11% per year. Fault rates for lines that do not carry broadband services (i.e. WLR) are somewhat lower at 8%.
- 4.25 The fault rates for GEA-FTTC over both WLR and MPF bearers are higher but show a significant decline, which we attribute to the growing maturity of the service. Sometimes, in the early stages of deployment of a new service, we observe a higher fault rate as new processes and expertise are bedding in.
- 4.26 These fault rates mean that on average customers experience an in-tariff fault approximately:
- once every 9 years for lines carrying standard broadband services;

- one every 12 years for WLR lines that do not have a broadband service; and
- once every 6 to 7 years for lines carrying superfast broadband services;

4.27 We set out a more detailed analysis of the fault rates, and forecasts for the forward look market review period in Annex 5.

The incidence of out-of-tariff activities has risen over recent years

4.28 The overall volume of out-of-tariff activities rose by [X] (35 - 45%) between 2011/12 and 2015/16.

4.29 Table 4.4 shows the incidence of out-of-tariff activities in 2015/16, split between those where a fault was eventually identified and were fixed 'in tariff', and those that were chargeable. It shows that out-of-tariff activities now constitute a significant proportion of the overall volume of reactive fault repair activities undertaken by Openreach ranging from [X]% for WLR to [X]% for WLR+SMPF.

Table 4.4: Summary of fault repair activities 2015/16, incidence per 1,000 lines per annum

Product	Faults (excluding non-chargeable out-of-tariff activities)	Non-chargeable out-of-tariff activities ⁶²	Chargeable out-of-tariff activities	All faults and out-of-tariff activities	Out-of-tariff activities as proportion of all faults and out-of-tariff activities
WLR	[X]	[X]	[X]	[X]	[X]
MPF	[X]	[X]	[X]	[X]	[X]
WLR+SMPF	[X]	[X]	[X]	[X]	[X]
WLR+FTTC	[X]	[X]	[X]	[X]	[X]
MPF+FTTC	[X]	[X]	[X]	[X]	[X]

Source: Ofcom analysis of BT data submitted in response to the 2nd QoS information request dated 25 May 2016

Openreach's investment in network reliability

4.30 A key driver of the level of network faults is how much Openreach spends on its network to maintain the reliability of the services that run over it. A sustained level of capital and operating expenditure is needed to replace legacy network components that have reached the end of their useful life. It can also help reduce the impact of other factors that affect the fault rate, such as heavy rainfall and maintain a modern design standard that is better able to cope with the demands of data rich services.⁶³

4.31 In the light of this, first we consider Openreach's investment in its network over recent years. Second, we consider Openreach's planned investment in the network over the coming period and discuss how we are proposing to take account of this in developing our charge control proposals in the WLA market. Third, we summarise

⁶² SIN 349 faults detected during out-of-tariff activities. Included in fault rates discussed above.

⁶³ [X]

how we have taken into account assumptions on Openreach's investment in network health and fault levels in our overall package of quality of service remedies proposals.

Openreach's historical investment in the copper access network

- 4.32 Openreach incurs both capital expenditure (capex) and operating expenditure (opex). In principle, capex is related to acquiring and retaining the physical assets used to provide the services that run over the network, whereas opex is related to the ongoing day-to-day functioning of the business, including the costs incurred in operating and maintaining the physical assets.
- 4.33 To get a full picture of Openreach's investment, it is necessary to look across both capex and opex. Below, we compare Openreach's historic capex and opex attributed to WLR and MPF services to the levels we would expect based on the standard (top-down) approach to forecasting efficient costs we use to set charge controls.
- 4.34 Table 4.5 shows Openreach's historic capex between 2011/12 and 2015/16. It compares it to depreciation for WLR and MPF services. This is because our standard forecasting approach assumes that to maintain an ongoing network in a steady state, supporting broadly constant service volumes, an operator would need to spend sufficient capex each year to replace the assets that have been depreciated (i.e. capex = depreciation).⁶⁴ Table 4.5 also shows the trend in mean capital employed (i.e. the current net value of its asset base) which is a function of both capex and depreciation.

Table 4.5: Openreach capital costs for WLR and MPF services

(£m nominal)	2011/12	2012/13	2013/14	2014/15	2015/16
Capex	[X]	[X]	[X]	[X]	[X]
Depreciation	767	828	776	758	698
Mean capital employed	9,046	8,961	8,599	7,611	7,508

Source: Capex figures from Ofcom analysis of management account information provided by BT to Ofcom on 5 February 2016 and information extracted from BT regulatory accounting system using data extraction tool; depreciation and mean capital employed from published Regulatory Financial Statements (RFS).

- 4.35 We may expect some divergence between steady state capex and actual capex due to capex varying during an investment cycle. However, during the period shown, Openreach's annual capex was consistently lower than annual depreciation. The underspend was in the region of £[X] between 2011/12 and 2013/14, narrowing to £[X] in 2014/15 and £[X] in 2015/16. The trend in mean capital employed is largely driven by the balance of capex and depreciation⁶⁵ – in general, if capex is higher than depreciation, mean capital employed increases, and vice-versa. Mean capital employed has reduced from c.£9 billion in 2011/12 to £7.5 billion in 2015/16. In addition, the gross replacement cost⁶⁶ of the assets used by WLR and MPF has

⁶⁴ Over time capex could fall below depreciation in the steady state due to efficiency improvements, although we would not expect this difference to be large.

⁶⁵ Mean capital employed is also driven by other factors such as asset price changes.

⁶⁶ Gross replacement cost (GRC) is the value of the assets held by the firm before the effect of depreciation is taken into account. It is effectively the cost of replacing the firm's assets today with new assets.

reduced from c.£[3<] to c.£ [3<] during this period, and the average age of the asset base appears to be older (as illustrated by the ratio of net replacement cost⁶⁷ to gross replacement cost reducing from 38% to 34%⁶⁸).

- 4.36 Based on these trends, it appears that Openreach's capex has been lower than the level required to replace the assets that have reached the end of their useful life.
- 4.37 Table 4.6 below sets out our forecast of opex between 2011/12 and 2015/16 when setting the 2014 WLR/MPF charge control. It compares this to Openreach's actual opex during this period.

Table 4.6: Comparison of WLR and MPF opex – Ofcom forecast vs. actual spend

(£m nominal)	2011/12	2012/13	2013/14	2014/15	2015/16
Ofcom forecast	1,251	1,220	1,206	1,185	1,170
Openreach actual spend	1,254	1,370	1,367	1,377	1,138

Source: Ofcom forecast from 2014 WLR/MPF charge control model; Openreach actual spend from published RFS

- 4.38 Our standard forecasting approach generally assumes a network with relatively constant volumes (as is the case for WLR and MPF services) will have a broadly flat profile of opex over time and may decrease due to our forecast of efficiency. Table 4.6 shows that we forecast a small gradual reduction in opex between 2011/12 to 2015/16 (from about 1.3bn per annum to 1.2bn per annum), with the reduction mainly being driven by assumed year-on-year operating efficiencies. In comparison, Openreach's actual opex between 2011/12 and 2014/15 was about £1.3 billion to £1.4 billion per annum. This was considerably higher than in previous years and exceeded Ofcom's forecast by between c.£3m and c.£190m per annum. In 2015/16, on the other hand, actual opex was much closer to (slightly below) Ofcom's forecast.
- 4.39 Openreach's higher than expected opex over the period may reflect the reduced capex spending shown in Table 4.5, as more heavily depreciated assets would normally be expected to cost more to maintain. For example, older equipment may be more prone to breaking down and would likely require engineers to reactively repair it more frequently.
- 4.40 Table 4.7 shows that Openreach's combined total expenditure for WLR and MPF (totex = capex + opex) between 2011/12 and 2015/16. This was approximately £[3<] to £[3<] per annum. In comparison, had Openreach's capex and opex been in line with our forecast, this would have resulted in total expenditure of approximately £2.0 billion to £2.3 billion per annum.

⁶⁷ Net replacement cost is the value of the assets held by the firm after the effect of depreciation is considered. It is effectively the cost of replacing the firm's assets today with assets of the same age (i.e. have depreciated by the same amount).

⁶⁸ 2014 Ofcom WLR/MPF charge control model and 2017 Ofcom WLA charge control model.

Table 4.7: Comparison of cash costs for WLR and MPF - annual totex

(£m nominal)	2011/12	2012/13	2013/14	2014/15	2015/16
Ofcom forecast	2,267	2,262	2,174	2,014	2,080
Openreach actual spend	[X]	[X]	[X]	[X]	[X]
Difference	[X]	[X]	[X]	[X]	[X]

Source: Ofcom forecast from 2014 WLR/MPF charge control model; Openreach actual spend from published RFS and Management account information provided by BT to Ofcom on 5 February 2016

- 4.41 Although actual total expenditure was lower than forecast, Openreach's level of profitability for these services has been close to its cost of capital. The reason for the difference in cash spent and profitability is that capex is recovered over a number of years (depending on the accounting life of assets), whereas opex is recovered in-year. Consequently, Openreach's approach of favouring opex over capex has led to cash savings of about £[X] over this period (relative to Ofcom's forecast) but has not resulted in excess profitability.
- 4.42 We have also considered Openreach's spending specifically on its Fault Volume Reduction programme (FVR). The level of capex Openreach spends on the FVR programme is particularly relevant to network reliability as it comprises key fault prevention activities such as waterproofing the copper network, upgrades to meet modern service demands and replacing obsolete assets. Figure 4.8 below sets out Openreach's annual FVR capex between 2006/07 and 2015/16.

Figure 4.8: Openreach FVR copper network capex (£m, nominal)

[X]

Source: Management account information provided by BT to Ofcom on 5 February 2016. 2015-16 estimated, other figures actual expenditure

- 4.43 Figure 4.8 shows that since 2011/12 Openreach's FVR capex has been in the region of £[X] per year, compared to £[X] per year between 2006/07 and 2009/10. Openreach's volumes of copper-only based services have stayed relatively flat over this period.⁶⁹
- 4.44 In summary, despite the increasing quality of service demands since the introduction of repair quality standards in 2014, it appears that Openreach has invested lower than expected capex in its network over the last five years, [X]. Instead, it appears that Openreach has opted to spend higher opex during this period. If Openreach maintains this approach, there is a risk that fault rates would increase. Even if Openreach spends sufficient opex such that it continues to meet repair quality standards, the outcomes for customers would be worse given the stress and inconvenience associated with faults.

Investment in the access network over the review period

- 4.45 We would not usually be concerned by Openreach's chosen split between capex and opex (particularly if we do not observe excess profitability), if this does not affect customer outcomes.

⁶⁹ Management account information provided by BT to Ofcom on 5 February 2016.

4.46 However, given the prolonged period of low capex in the copper access network, there is a risk that network reliability may diminish because of underinvestment, with a resulting impact on customers.

4.47 We note that [redacted]

“[redacted]”⁷⁰

4.48 [redacted]⁷¹

4.49 As a result, Openreach has embarked on a new FVR programme, which aims to [redacted].⁷² The programme will involve an investment of £[redacted] in the FVR programme spread over [redacted] years and the recruitment of an additional [redacted] technicians to carry out the fault prevention work. If successful, Openreach aims to reduce the network fault rate from its current position of 110 faults/1000 lines per annum by at least 10% (i.e. to less than 99 faults per 1000 lines).

Our proposals

4.50 Given the significant benefits to competition and customers that fewer network faults can deliver, we support the increase in FVR investment. We want to ensure that Openreach follows through with its planned investment in the FVR programme. In this review, we are proposing the following:

- Higher quality standards in terms of timeliness of fault repairs, which in turn should provide stronger incentives to reduce faults. One of our considerations in proposing an increase in repair standards is that this should create financial incentives for Openreach to reduce the fault rate. Indeed, [redacted].⁷³
- A decrease in repair opex costs that we propose to allow Openreach to recover through its regulated charges consistent with its stated intention to reduce fault volumes. As set out in our March 2017 WLA Consultation (Annex 11), we have identified the portion of base year (2015/16) operational costs that are relevant for repairs. These costs include, for example, the cost of engineers, training, management, equipment and other expenses. We have forecast these costs by making a downward adjustment to take into account the planned reduction in the fault rate from 11% by at least 10%.
- No additional capex to carry out network health allowed in the charge control. As set out in the March 2017 WLA Consultation (Volume 2, Section 2), in considering the appropriate level of capex that Openreach should be allowed to recover through its regulated charges, we have looked at whether it is appropriate to allow for the additional capex Openreach predicts will be necessary to implement its network health plan. Our analysis indicates that the capex allowance under the steady state ongoing network approach used in the charge control will provide sufficient funding for Openreach to implement its plan.

Question 4.1: Do you agree with our proposal to incorporate the anticipated lower fault rate in the charge control, and not to allow a specific adjustment for the related capital expenditure? Please provide reasons and evidence in support of your views.

⁷⁰ [redacted]

⁷¹ [redacted]

⁷² [redacted]

⁷³ [redacted]

Question 4.2: In Annex 5 we have set out our forecast for fault rates. Do you agree with our forecast? Please provide reasons and evidence in support of your views.

Diagnostic testing developments

The current arrangements can lead to poor outcomes for customers

- 4.51 Telecoms providers have told us that the current arrangements for dealing with out-of-tariff activities can lead to poor outcomes for customers. Often, neither the retail telecoms provider nor Openreach can remotely detect the fault that is impairing broadband performance. Retail telecoms providers are reluctant to incur chargeable out-of-tariff activities unless there is a strong indication that Openreach's service or the customers internal wiring is faulty. Thus, customers can experience delays or multiple interactions with their telecoms provider before their problem is resolved.
- 4.52 The increase in out-of-tariff activities also puts pressure on Openreach's field resources due to the increase in demand for skilled and well equipped technicians.

Openreach has made significant investments to improve its diagnostic capabilities

- 4.53 During the last five years, Openreach has made significant investments to improve its diagnostic capabilities. We understand that the following initiatives are complete, and are now part of Openreach's standard processes:
- Copper Integrated Demand Testing (CIDT) – In 2012 Openreach introduced new testing functionality on its exchange based line test equipment. This functionality is very effective at detecting high resistance faults that conventional exchange based line tests cannot detect.
 - Hand-held testers – Openreach has equipped its field technicians with advanced test equipment that can perform electrical line tests and broadband service layer tests. These testers can detect line and customer wiring problems more effectively than conventional line tests because the tests are two-ended (the hand-held tester works in conjunction with the exchange based test equipment).
- 4.54 In addition, new capabilities are being developed which should further improve Openreach's diagnostic accuracy when they are fully incorporated into Openreach and telecoms providers' diagnostic processes:
- GEA service layer diagnostic tools – Openreach has developed diagnostic tools that use sophisticated data processing techniques to analyse service level data extracted from Openreach's GEA broadband systems (such as synchronisation rates) to assess the performance of individual lines. These tools enable Openreach to benchmark the performance of individual broadband connections to determine whether they are performing to their full potential, and to detect the presence (but generally not the precise location) of certain line conditions that impair broadband performance.⁷⁴
 - MPF and SMPF service level diagnostic tools – Openreach has also worked with other large telecoms providers to develop service layer diagnostic tools for MPF

⁷⁴ High resistance joints, bridge taps and external sources of electrical noise.

and SMPF services. Under the 'big data' initiative, telecoms providers supply Openreach with service layer data from their broadband systems, which Openreach then processes to provide diagnostic information about the performance of individual lines (similar to the GEA tools above).

Our views on the diagnostic testing developments

- 4.55 We consider that the 'big data' initiative could deliver significant benefits to Openreach, telecoms providers and ultimately customers. It has the potential to greatly improve remote diagnostic capabilities. We anticipate telecoms providers and Openreach will be able to make more informed decisions about the best means to resolve a customer's issue. They should also allow better targeting of preventative maintenance.
- 4.56 Given the potential benefits for customers, we think there is a strong case for Openreach and telecoms providers to continue with these developments and to integrate them fully into operational processes by making the information available at the point of customer contact, in order to realise their potential.
- 4.57 There is also an opportunity for Openreach and telecoms providers to review the standard to which lines carrying broadband services are maintained and the associated commercial arrangements. With improved remote diagnostics, lines carrying broadband services could be maintained to a higher standard, bringing some out-of-tariff activities within the scope of 'in tariff' repairs.
- 4.58 Given the importance of these developments and the need for engagement between Openreach and telecoms providers, we have asked the OTA2 to provide such assistance as is required. We also intend to monitor progress and will consider informal or formal intervention if we consider that customer benefits have not been realised. In the first instance, it is for industry to pursue these developments collaboratively. Should Openreach and telecoms providers agree on a new testing standard, we will consider the implications, including regarding costs, in future reviews.

Question 4.3: Do you agree with our assessment of the role better diagnostics could play in improving fault resolution for both telecoms providers and customers, and how should these improvements be realised? Please provide reasons and evidence in support of your views.

Section 5

Regulating BT's service performance for repairs

Introduction

- 5.1 This section sets out our proposals for *ex ante* remedies relating to fault repair over the Wholesale Local Access (WLA) market review period. It draws on our approach to quality of service (QoS) regulation set out in Section 3, our proposals relating to network reliability in Section 4, and on our review of Openreach's recent repair performance in Annex 6.
- 5.2 As described in Section 8, we consider that the proposals set out in this section would achieve our statutory duties and satisfy the relevant legal tests. In reaching these proposals, we have also taken into account our regulatory experience from previous market reviews, recent developments in these markets based, in particular, on information on quality provided by Openreach and its customers and by consumers in response to new research we have commissioned, and also expected developments over the course of the three-year review period.

Summary of our proposals

- 5.3 In the Narrowband⁷⁵ and WLA⁷⁶ market reviews, we have proposed SMP conditions requiring BT to comply with such quality of service requirements as we direct from time to time.⁷⁷ Here we are proposing to exercise that power to impose a direction setting QoS standards that BT must comply with for repair.

Quality standards for repairs

- 5.4 The following tables set out our proposed QoS standards for the proportion of repairs that BT must complete within the service level agreement (SLA) timescales – i.e. 'on time'. The proposed standards apply to the repair of all WLR, MPF, and GEA-FTTC faults in aggregate. They apply separately to both service maintenance levels 1 and 2 (SMLs 1 and 2⁷⁸). We propose to measure compliance in each of Openreach's ten UK geographic regions⁷⁹ on an annual basis. We also propose to make a 3% allowance for *force majeure* events (also known as Local 'Matters Beyond Our (BT's) Reasonable Control', or 'MBORCs'⁸⁰). The standards adjusted for this exemption are also shown in Table 5.1.

⁷⁵ <https://www.ofcom.org.uk/consultations-and-statements/category-1/narrowband-market-review>

⁷⁶ <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>

⁷⁷ Summarised in Section 2.

⁷⁸ SML1: Fault clear by 23:59 day after next, Monday to Friday, excluding public and bank holidays.

SML2: Fault clear by 23:59 next day, Monday to Saturday, excluding public and bank holidays.

⁷⁹ Scotland, North East, North West, North Wales & North Midlands, South Wales & South Midlands, Wessex, South East, London, East Anglia, and Northern Ireland. A breakdown of each of these areas by exchange name and identifier is available at:

https://www.ofcom.org.uk/data/assets/pdf_file/0022/81067/schedule_3_annex_29.pdf.

⁸⁰ E.g. criminal, intentional, or negligent damage to the network.

Table 5.1: Proposed standards for repairs completed within SLA timescales⁸¹

QoS standard applicable to each of the ten geographic areas	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA timescales (Adjusted standard for <i>force majeure</i>)	80% (77%)	83% (80%)	90% (87%)	93% (90%)

- 5.5 In addition, in up to two regions each year, we propose to incorporate into our compliance assessment exemptions for High Level MBORC events for up to eight weeks per declaration.⁸²
- 5.6 We also propose new QoS standards for the proportion of repairs completed five working days after the time promised in the SLA. Table 5.2 below summarises the proposed standards. We propose to assess compliance for the relevant products (WLR, MPF, and GEA-FTTC) at SMLs 1 and 2 separately but, in contrast to ‘within SLA’ standards, we propose to assess compliance at the UK level. We do not consider it appropriate to specify a fixed allowance for *force majeure*; however, in measuring compliance we propose to allow for High Level MBORC declarations in up to two regions each year subject to a limit of eight weeks per declaration.

Table 5.2: Proposed standards for repairs completed five working days over SLA timescales⁸³

QoS standard applicable to UK as a whole	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA +5 days	N/A	95%	96%	97%

Service level guarantees (SLGs) for repairs

- 5.7 To ensure the continued effectiveness of the SLAs and SLGs that BT is required to include in its contracts for network access and to further incentivise Openreach to deliver material improvements in the ‘long tail’ of late repairs (i.e. beyond the timescales set out in the SLAs), we propose to remove the limit of 60 payable days on Openreach’s liability of compensation for late repairs (i.e. its SLG payments).⁸⁴

⁸¹ The standards apply to all WLR, MPF, and GEA-FTTC repairs at each of SMLs 1 and 2.

⁸² E.g. incidents affecting over 2,000 lines, incidents which are/are likely to become the subject of regional or national media interest, and anything likely to have a significant impact on the BT and/or Openreach brand.

⁸³ The standards apply to all WLR, MPF, and GEA-FTTC repairs at each of SMLs 1 and 2.

⁸⁴ Payable days for late repair SLGs are based on working days, although these can vary by SML. We note that BT would continue to have the opportunity to exclude its liability for MBORCs under the terms of its contracts with telecoms providers.

Structure of this section

- 5.8 This section first outlines the products which we intend to regulate, the repair times we think Openreach should meet, and the compliance structure and levels of the proposed standards. We then consider other factors in our remedy design, including the assessment period, the geographic application, and the allowances for MBORC events. Finally, we have set out our proposals concerning the payment of SLGs for delays to repairs.

Aim and effect of regulation

- 5.9 As discussed in Section 3, as a consequence of BT's SMP in the WLA and WFAEL markets, there is the risk, in contrast to a competitive market, that Openreach may not provide the service quality that telecoms providers and end users require. We have subsequently determined that QoS regulation is necessary to deliver quality and to ensure that the network access remedy facilitates effective downstream competition.
- 5.10 We intend to use QoS standards as our primary tool for driving Openreach performance improvements. Our objective is to address our competition concerns relating to QoS arising out of BT's SMP and, in so doing, further the interests of consumers by providing them greater certainty about the length of time they will be out of service following a fault by establishing clear performance targets for Openreach. Further, we expect that setting standards on repair times will give telecoms providers confidence in the services they purchase to allow them to compete effectively, while being measurable in terms of what constitutes a success or a failure.

Quality standards for on time repair

How and why we set an 80% quality standard level for on time repair in 2014

- 5.11 In the 2014 FAMR, Ofcom undertook a review of matters relating to quality of service delivered by BT (through Openreach) in the supply of regulated wholesale fixed access services. We concluded, among other things, that over several years there had been a gradual decline in Openreach's performance, in particular in relation to fault repairs for WLR and MPF services. Consequently, we imposed a number of new SMP obligations on BT, including setting annual quality standards covering the on time repair of these services (see Table 5.3). The repair standards were applied separately to WLR services subject to SML1 and MPF services subject to SML2 in each of Openreach's ten UK regions, and increased over the three-year, forward-look period of the 2014 FAMR.

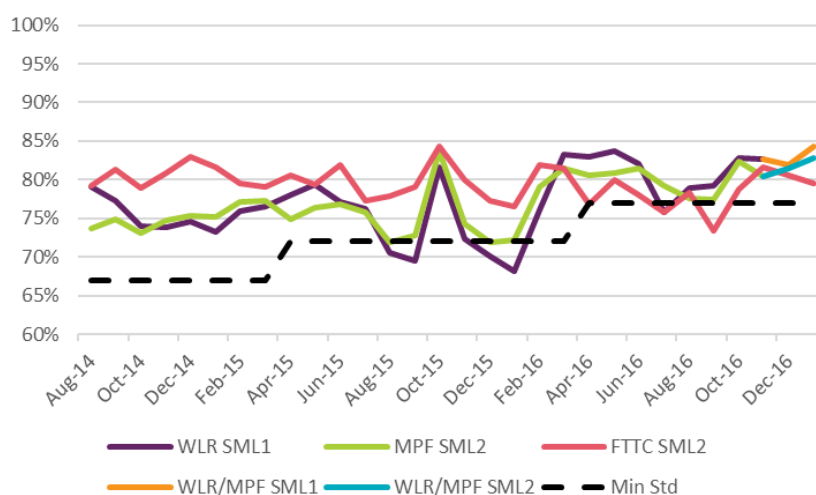
Table 5.3: Openreach repair QoS standards for WLR services at SML1 and MPF services at SML2⁸⁵

QoS standard applicable to each of the ten geographic areas	First year (2014/15)	Second year (2015/16)	Third year (2016/17)
Repair completion within SLA +5 days (Adjusted standard for <i>force majeure</i>)	70% (67%)	75% (72%)	80% (77%)

5.12 In October 2016 the scope of the standards was expanded due to a change in the SMLs for WLR and MPF purchased by telecoms providers.⁸⁶ We used our direction-making powers to set a new standard applying to the repair of all WLR and MPF lines at SML1 and another new standard to all WLR and MPF lines at SML2. The compliance period for the new standards will run from 1 November 2016 to 31 March 2018.

Openreach's performance against the repairs standards set in the FAMR

5.13 Since imposing QoS standards in the 2014 FAMR (as modified in 2016), the key performance indicators (KPIs) provided by Openreach indicate a degree of improvement in the proportion of repairs completed within SLA at the UK level for both WLR and MPF. There has also been a reduction in the significant volatility that occurred prior to the FAMR period (see Figure 5.4). Nevertheless, repair performance has not returned to 2009/10 levels, as shown in Annex 6.⁸⁷

Figure 5.4: UK faults restored on time for WLR, MPF, and GEA-FTTC services (%)

Source: Openreach mandatory non-discrimination KPIs

⁸⁵ In addition to a fixed 3% allowance for *force majeure* (Local MBORC) events, the 2014 FAMR also allowed BT to make use of time-limited High Level MBORC declarations within the performance calculations for up to two regions per year.

⁸⁶ https://www.ofcom.org.uk/_data/assets/pdf_file/0032/92678/20161017-QoS-Statement_Non-confidential.pdf.

⁸⁷ Also see Annex 30 of the 2014 FAMR Statement: https://www.ofcom.org.uk/_data/assets/pdf_file/0026/78812/annexes.pdf.

Our reasoning and proposals for setting higher levels for quality standards for on time repair

The products within the scope of our proposed standards

- 5.14 In the 2014 FAMR, we imposed QoS standards on BT in relation to fault repair for WLR and MPF services. These were BT's highest volume services and were the services about which we had observed particular concerns about quality. As described in Section 3, we propose that QoS standards should continue to apply to the repair of WLR and MPF faults. Further, based on the current and likely future consumption of GEA-FTTC services, and the potential competition concerns we have identified in the 2017 WLA Consultation we proposed that the repair standards for the next review period should also apply to GEA-FTTC.⁸⁸

Repair times to which the proposed standards should apply

- 5.15 In the 2014 FAMR, we concluded that it was appropriate to set regulatory standards for Openreach's repair performance by reference to the existing, industry-agreed service level agreements (SLAs). At that time, the rentals of WLR at SML1 (typically a 'two day' repair) and MPF at SML2 (typically a 'one day' repair) accounted for the majority of access lines consumed for these products and were subject to particular concerns regarding poor quality. Consequently, we decided to impose standards for these product/care level combinations, thereby requiring a certain percentage of repairs to be completed to SMLs 1 and 2 timescales.
- 5.16 We consider that setting standards by reference to the repair times specified in the SLA continues to be appropriate. This ensures that telecoms providers have a good degree of certainty that Openreach will deliver the service that it has contractually agreed to deliver within an expected timeframe.⁸⁹ Confidence in the quality of the wholesale input subsequently facilitates effective competition downstream, for instance, by ensuring that telecoms providers can make commitments to their customers regarding the speed of repair that they should expect. This approach supports the successful provision of the network access remedy, and we therefore consider it remains appropriate to use existing SLAs as the time element for the repair QoS standards.
- 5.17 As the vast majority of access lines (for WLR, MPF, and GEA-FTTC) are currently provided at either SMLs 1 or 2, we consider that it is appropriate to continue to apply QoS standards to repair performance at these SMLs going forward. Due to the high volumes of SMLs 1 and 2, there is a significant risk that poor repair performance for these services could have a negative impact on both consumers and competition.
- 5.18 In contrast, the volumes of the relevant products purchased at the premium SMLs⁹⁰ account for just a fraction of total rentals and therefore quality for these services has a lesser impact on competition and consumers. As in the case of 2014 FAMR, we

⁸⁸ We are seeking stakeholder comments on this proposal through a consultation question posed in Section 3.

⁸⁹ We note that the 2014 FAMR concluded that the regulatory and contractual arrangements (i.e. SLAs/SLGs) at that time had not been sufficient to ensure that BT maintains it's a sufficiently high level of quality in the supply of WLR and MPF services.

⁹⁰ SML3 (report by 13:00, fault clear by 23:59 same day. Report after 13:00, fault clear by 12:59 next day, seven days a week, including public and bank holidays) and SML4 (fault clear within six hours, any time of day, any day of the year).

therefore do not propose to set quality standards on repairs subject to these care levels for reasons of proportionality. However, we propose to keep Openreach's performance under review through our ongoing monitoring activity.⁹¹

- 5.19 This approach also aligns fairly well with our consumer research which indicates that most respondents feel that it would be reasonable to wait up to three calendar days for their broadband service to be restored.⁹² The research suggests a tipping point at three days, where consumers become increasingly dissatisfied with their provider's ability to resolve a loss of service. We consider that regulation focused on the completion of repairs within a one to two day timeframe is broadly aligned with acceptable outcomes for most customers and therefore supports our proposals to apply QoS standards to the repair of services subject to SMLs 1 and 2.

Addressing repairs that take longer than SLA timescales to complete

- 5.20 Setting a QoS standard that requires improved performance for repairs delivered to SMLs 1 and 2 could increase the incentives on Openreach to allow repairs that are not completed to these targets to deteriorate. An important aim of our regulation is to improve certainty for these customers and to ensure that Openreach is focused on resolving faults that it has failed to repair within the contracted timeframes.
- 5.21 As described in Section 3, consumer research indicates that most customers believe that it is unacceptable to wait longer than a week for a fault to be repaired. This is broadly equivalent to five or six working days after the target timeframes for SML2 repairs and three or four working days for SML1 repairs.
- 5.22 We consider it appropriate to propose to set QoS standards that require Openreach to maintain a high level of repair performance at five working days beyond the time set out in the SLA. We consider that this timeframe is easily comprehensible and broadly aligned with consumer expectations, and will provide added certainty that, where agreed timeframes are missed, service will be restored within the next five working days for the vast majority of customers. It should also significantly reduce the incentive and ability of Openreach to allow the timeliness of repairs that fail to meet the SMLs 1 and 2 targets to significantly degrade.

Question 5.1: Do you agree with our proposals to set standards on repairs delivered to SMLs 1 and 2 timescales? Do you agree with our proposal to set new standards for repairs completed five working days over SLA for SMLs 1 and 2? Please provide reasons and evidence in support of your views.

Our considerations for the structure of the proposed standards

- 5.23 In the 2014 FAMR, the SMP conditions imposed by Ofcom for the repair standards accounted for the majority of overall volumes for MPF and WLR. As previously noted, the standards applied to SML1 for WLR and SML2 for MPF.
- 5.24 However, for the market review period we propose to set repair QoS standards applicable to all lines provided over WLR, MPF, and GEA-FTTC for each of SML1 and 2. This is consistent with the approach we took in setting new repair standards in 2016 where we considered that defining cross-product standards at a given SML had

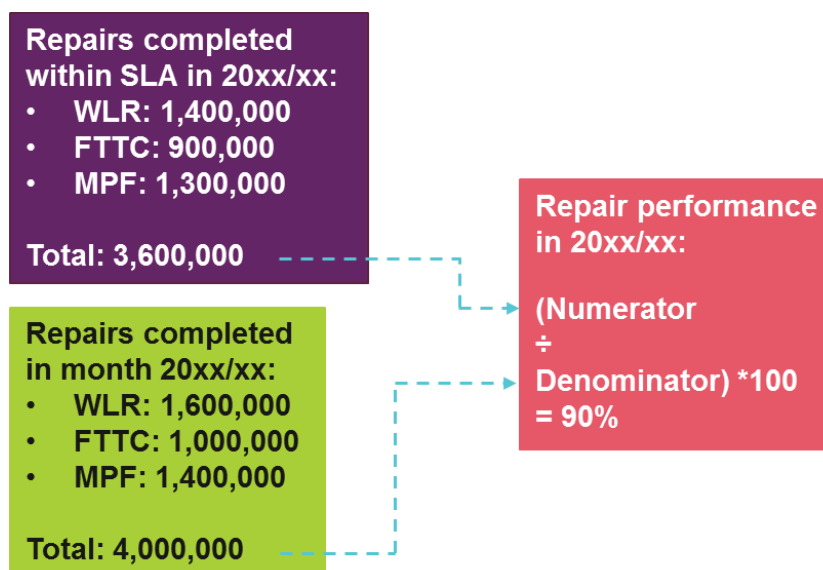
⁹¹ We note that, over the FAMR period, WLR, MPF, and GEA-FTTC on time repair performance for SML3 at the UK level has been similar, if not slightly higher, than performance for the same metric at SMLs 1 and 2.

⁹² Jigsaw Research, 2017.

the benefit of future-proofing our QoS regulation in the event of future shifts between care levels (see Section 2). Further, we consider that applying standards across the relevant products, rather than on a service/SML basis, mitigates the risk of a proliferation of standards to ensure our overall package of proposed QoS measures does not become disproportionate.

- 5.25 This approach also reduces the risk that standards are unreasonable in the event that they are applied to a very small volume of lines for a specific service with an SML1 or 2 repair SLA. In our 2016 Directions and Consents Consultation,⁹³ we considered that applying standards to a low volume of lines would make delivering to the required levels more challenging for Openreach and would call into question the reasonableness of those standards. We therefore consider that our proposed approach to structuring the repair standards will ensure that the standards are proportionate and that compliance can be assessed on a robust basis.
- 5.26 Figure 5.5 below provides a worked example of our proposed structure for the repair QoS standards. The denominator in our performance calculation would be the sum of all completed repairs in a given year that are attributable to WLR, MPF, and GEA-FTTC at SMLx (4,000,000). The numerator would then be the sum of all WLR, MPF, and GEA-FTTC repairs provided at SMLx that were completed within the contractually agreed timeframe (i.e. the SLA) in the relevant year (3,600,000). The result of this calculation is then multiplied by 100% to give a percentage performance that is assessed against our QoS standards.

Figure 5.5: Worked example of proposed structure of repair standards at SMLx



- 5.27 Imposing a single QoS standard for each care level does not guarantee that the performance of each service (WLR, MPF, or GEA-FTTC) would meet the standard. Therefore, we have considered the extent of any risk that Openreach could discriminate between different services by reducing the performance of some services in favour of others. However, we consider that Openreach is unlikely to have the ability to discriminate in this manner. Openreach would have to significantly

⁹³ Ofcom, 2016, *Quality of Service for WLR and MPF, Proposed Directions and Consents relating to the minimum standards and KPIs imposed in the 2014 Fixed Access Market Reviews*, https://www.ofcom.org.uk/data/assets/pdf_file/0019/71524/quality-of-service-wlr-mpf.pdf.

outperform the standard for some services to allow others to degrade, which could be challenging in the context of more demanding QoS regulation as viewed in the round.

- 5.28 Further, we consider that the structure of Openreach's operations does not readily lend itself to discrimination on repair times between different services and that we have an active QoS monitoring programme (supported by the ongoing provision of KPIs) which would allow us to quickly identify such discrimination if it arose.⁹⁴ If we had substantial concerns regarding discriminatory behaviour of this nature, we would have the power to act rapidly to modify our regulation during the course of the review period.⁹⁵ We also note that the proposed new structure of Openreach under commitments made by BT to Ofcom makes it a duty of the Directors of Openreach to treat all of its downstream customers equally.
- 5.29 Moreover, we note that GEA-FTTC is not currently available with an SML1 repair SLA. However, in the event that Openreach starts providing GEA-FTTC with at this SML, we propose that fault repairs attributed to this product at this care level should be part of our assessment of compliance with the SML1 standards that also includes WLR and MPF services.

Question 5.2: Do you agree with our proposed structure for the QoS standards? Please provide reasons and evidence in support of your views.

Levels of the proposed standards

Quality standards for repairs completed on time

- 5.30 As set out in Section 3, customers and competition benefit from a reduction in the time customers spend out of service and from certainty in the repair service that they will receive. We set out our view that certainty means performance against a given commitment of over 90%, which is higher than the levels of the standards we imposed in the 2014 FAMR.
- 5.31 Below we set out our proposals in relation to the levels at which we propose to set QoS standards for repairs, by reference to the three considerations we identified in Section 3: (i) the impact on consumers, telecoms providers, and competition; (ii) Openreach's operational capabilities; and (iii) the costs to consumers and telecoms providers.

Impact on customers, telecoms providers, and competition

- 5.32 In the 2014 FAMR we established a bounding range for possible minimum standards. Having analysed Openreach's service delivery in recent years, and in the absence of other clear benchmarks, we determined it appropriate to use performance in 2011/12 (77.7% excluding *force majeure*) as the lower bound for the range of the standards in respect of repair completion. Openreach is now performing above this level – albeit not significantly – and, as such, we think the lower bound should be higher than we considered in the FAMR.
- 5.33 As set out in Section 3, we consider that it is appropriate to set standards equal to or greater than 90% to afford telecoms providers sufficient certainty and confidence

⁹⁴ See Section 7 for our proposed transparency obligations for both installations and repairs.

⁹⁵ Setting directions for compliance with the repair QoS standards on a service-by-service basis would, however, require us to consult for a minimum four-week period.

regarding the service they are purchasing from Openreach. Further, our research⁹⁶ suggests that most customers would be satisfied with repairs completed within three calendar days, which broadly aligns with the contractual timescales for SMLs 1 and 2. Increasing the percentage of on time completions against these SLA targets would result in a greater proportion of consumers receiving repairs within a timeframe that they consider acceptable, thereby closing the gap between expectations and actual performance.

- 5.34 Moreover, as we describe in Section 4, we consider that setting challenging standards on timeliness of fault response should have the secondary benefit of incentivising BT to take action to reduce fault rates proactively. In our view, repair quality standards of at least 90% will mean that BT has the incentive to meet the targets in the most efficient way, which is likely to include cost savings via reducing fault rates on its network.⁹⁷ In turn, investment in network reliability should have a positive knock-on effect on both telecoms providers and customers.
- 5.35 We therefore propose to take 90% as an appropriate lower bound for the range of the QoS standards as regards to repair completion, subject to this being operationally feasible. We also consider that the higher the level of performance Openreach can consistently achieve above this (i.e. the closer to 100%), the better the outcomes for competition.

Openreach's operational capabilities

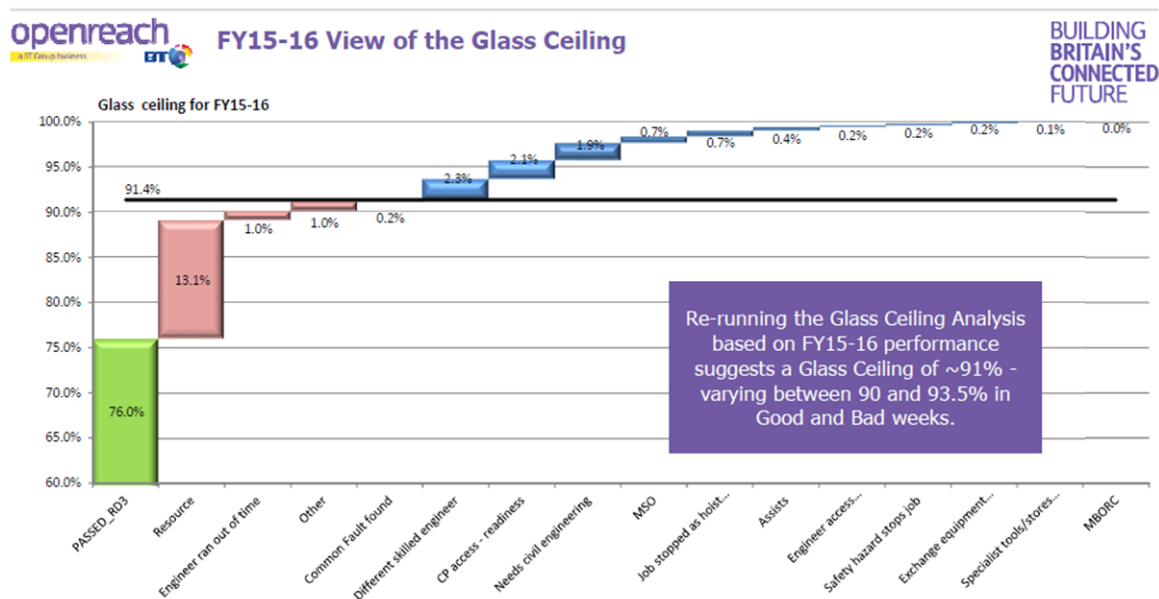
- 5.36 In setting QoS standards, we recognise that Openreach cannot meet every one of its service commitments all of the time. A small proportion of fault repairs fail at the execution stage. Openreach refers to these as 'on-the-day' failures, reflecting the fact that most failures relate to something that goes wrong while field technicians are working on jobs. Openreach considers that these failures represent a practical upper limit or 'glass ceiling' on its fault repair performance.
- 5.37 Consequently, in determining the levels of the proposed standards, we need to consider the factors which may limit Openreach's ability to resolve faults within the timescales for SMLs 1 and 2. To do so we have reviewed the operational reasons which Openreach says contribute to it failing to meet its contractual obligations.
- 5.38 We obtained information from Openreach about the incidence of these on-the-day failures for fault repair as shown by Figure 5.6 below. This information summarises the reasons for which repair jobs failed to be completed on the day during the year 2015/16. It is worth noting that these failures do not translate directly to SLA performance as on-the-day failures are not necessarily failures against the SLAs as discussed further below.
- 5.39 We also asked Openreach to explain what scope there may be to raise the glass ceiling by reducing the incidence of such failures. While Openreach acknowledges that there is scope to make improvements, it has not provided us with any information about the improvements that could be achieved. We therefore propose to rely on our own estimates concerning the scope for improvements.

⁹⁶ Jigsaw 2017.

⁹⁷ In this respect, we note that following initial conclusions of our Strategic Review, Openreach initiated its 'Network Health' programme which aims to reduce its annual fault rate from circa 110 faults per 1000 lines per year, by more than 10% over a five-year period.

5.40 Figure 5.6 indicates that Openreach's on-the-day repair performance in that year was 76.0%.

Figure 5.6: Openreach view of the glass ceiling



Source: Openreach

5.41 Figure 5.6 shows that Openreach considers that the operational limit or glass ceiling to its on-the-day field repair performance is about 91%. Openreach considers that 15.3% of the on-the-day failures were mostly due to factors within its control, primarily field engineering resources and the remaining 8.6% of on-the-day failures were due to other reasons that cannot be avoided with current processes.

5.42 On the basis of this information, we therefore consider that, with additional resources alone, and without changes to working practices, it would be operationally feasible for Openreach to achieve a repair within SLA performance of over 90%. Moreover, Openreach's on-the-day performance equates to a higher performance against the service maintenance level SLAs because:

- on-the-day failures classified as 'CP access – readiness' (accounting for 2.1% of failures) do not count as failures against the SLA because the failures were caused by customers or telecoms providers. This covers delays to repairs caused by, for example, an Openreach engineer having no access to the customer's premises, the customer not being present, ready, or available, and telecoms provider equipment issues; and
- Openreach's glass ceiling is expressed in terms of successful on-the-day field activities, whereas the QoS standards relate to the proportion of repairs completed within the relevant SLA – e.g. for SML1, by the end of the working day plus one. A proportion of on-the-day failures relate to matters such as an engineer requiring assistance could be addressed at a further attempt the following day. Consequently, a proportion of on-the-day failures, particularly for SML1, would meet the SLA.

5.43 Therefore, by adding the proportions of repair that could be completed as a result of an increase in resources, an adjustment for customer-caused delays, and a

translation of the on-the-day limit into a repair within the SLA maximum to 2015/16 performance, we subsequently estimate potential upper bounds of performance for SMLs 1 and 2 of 95.3% and 93.8%, respectively.

5.44 Further, we consider that there are incremental improvements that Openreach can make to current processes over the three-year market review period such that it is able to achieve a higher operational limit.⁹⁸ Our analysis suggests that a proportion of the aforementioned 8.6% of failures would be at least partially addressable:

- 2.3% is due to the need for a different skilled engineer. We estimate that half of these failures could be addressed by BT's ongoing efforts to multi-skill technicians and via better fault diagnostics, which should lead to engineers with the right set of skills being dispatching to jobs;
- 1.1% is due to the need for a hoist or an additional engineer to assist the one already on site. It is unlikely that all such jobs could be identified in advance, although there should be scope for improvement by having more platforms on standby and by a more prompt dispatch of assistance;
- 0.4% involve an obstruction to the engineer gaining access or a safety/hazard issue. Again, it is unlikely that every such job could be identified in advance; however, it is possible that improved communication with the relevant telecoms provider and better safety equipment could result in success in a number of cases; and
- 0.1% could be addressed by making non-standard tools to restore service more readily available to engineers before they arrive at a consumer's premises.

5.45 Factoring in the realisation of process improvements discussed above (such as engineer multi-skilling, better fault diagnostics, and wider availability of specialist equipment), our analysis indicates that these upper bounds of Openreach's technical capabilities could increase to 97.5% for SML1 and 95.8% for SML2 by the end of the coming market review period. An average of the two percentages, weighted 56/44 in favour of SML2 to reflect the volumes of repairs for the two SMLs, yields an overall figure of 96.6%,⁹⁹ which we consider would be the maximum level of repair within SLA performance that Openreach could achieve by the end of the period. We consider that it would be disproportionate to propose a standard above this level at this time and, therefore, that 96.6% serves as an appropriate ceiling to use in setting the repair standards.

Costs to telecoms providers and consumers

5.46 As described above, repairing a greater proportion of faults within contracted timeframes at SMLs 1 and 2 will require Openreach to increase its available engineer resources. We would be concerned if higher QoS standards led to materially higher retail prices as our evidence indicates that value for money is an important factor for many consumers (see Section 3).

⁹⁸ We concede, however, that there are certain causes of failure, such as the need for civil engineering work, for which it may not be economically efficient or practically possible for Openreach to effect improvements in its on-the-day fault repair performance.

⁹⁹ Calculation based on the split of SML1 and 2 repairs completed in 2015/16.

- 5.47 In order to assess the impact of our proposed repair standards, we have commissioned Analysys Mason to estimate the resource impacts of driving service quality improvements through regulatory intervention.
- 5.48 Analysys Mason have modelled the level of Openreach resources required in order to achieve a number of QoS targets. The results indicate the resource impacts of increasing performance against the SLAs for SMLs 1 and 2. We utilise these results within our charge control modelling to develop separate estimates of the costs of QoS improvements for the services we propose to charge control (MPF at SML1 through our top down model for copper services¹⁰⁰ and GEA 40/10 services at SML2 through our bottom up model for GEA services¹⁰¹). In Annex 7, we have set out the major outputs of their modelling work, including the resource uplift impacts of our proposals.
- 5.49 Our model does not allow us to separately identify the resource uplifts required for our installation and repair proposals. Therefore, we consider the cost impact of our proposals in the round in Section 8. This includes the impact of our expectations for lower fault rates.
- 5.50 Our assessment is that the higher standards we propose for installation and repair lead to an increase in costs which is proportionate in the light of our objectives, including the customer and competition benefits we have identified.

Levels options

- 5.51 Based on our analysis of the above factors, we have considered the following four options for the repair within SLA standards. We have considered standards set at or above 90%, as we believe these provide certainty for telecoms providers and are operationally feasible. We looked at a range of options which include setting standards at 96% for both SMLs 1 and 2, 93% for both SMLs 1 and 2, raising standards to 93% on SML1 and 90% on SML2, and 90% for both SMLs 1 and 2.

96% for both SMLs

- 5.52 We consider that setting an on time repair standard of 96% for either care level would be a theoretically achievable target and would maximise the benefits of competition while meeting users' rising expectations of telecoms services. However, we are conscious that this is at the top of our upper bound for the percentage of repairs Openreach could deliver on time and that it would represent a significant increase in performance from the status quo. Achieving such a standard would also require the consistent elimination of all of the field failures we have estimated as being within Openreach's control as well as the realisation of the process improvements we consider possible over the next three years. This leaves little margin for error and significantly increases the risk of failure; we consider that a 96% standard is therefore unlikely to be reasonable or proportionate at this time.

93% for both SMLs

- 5.53 For the reasons set out above, we consider that setting the QoS standard for repairs at 90+% would lead to improved outcomes for retail competition, as telecoms providers would have greater certainty regarding the repair performance of the access service they are purchasing. This improvement would also reduce consumer

¹⁰⁰ Ofcom, 2017. WLA Consultation, Annex 10.

¹⁰¹ Ofcom, 2017. WLA Consultation, Annex 11.

harm due to loss of service by increasing the proportion of repairs that are completed within a timeframe that consumers consider reasonable. In addition, we consider that requiring Openreach to deliver 93% of repair completions on time is operationally achievable through a number of changes to Openreach's current resourcing and operations.

93% for SML1, 90% for SML2

5.54 Analysys Mason's modelling indicates that there is a proportionately greater increase in resources required to complete a higher percentage of SML2 repairs on time compared to the increase required to complete the same proportion of SML1 repairs on time. This reflects the longer time window Openreach has to complete SML1 repairs relative to SML2 repairs. If, for example, Openreach fails to repair a fault on the first day it dispatches an engineer, that repair could still be resolved the following day. This might suggest that a lower standard would be appropriate for SML2 repairs to mitigate the cost of better repair performance. We have therefore considered setting the QoS standards at 93% for SML1 as outlined above but scaling down to 90% for SML2.

5.55 Our provisional view is that, if we were to apply a lower standard to SML2 in comparison with the standard we applied to SML1, this change could reduce demand for SML2 and appear to be a watering down of our proposed QoS regulation. Further, we consider that different standards could have a distortive effect by making it difficult to identify the differences in performance between the two SMLs in practice. This risks undermining the differentiation between these two services, which would reduce the potential for this remedy to support competition on the basis of quality at the retail level. Setting standards at different levels might also be confusing and counter to our aim to improve industry clarity and certainty regarding Openreach repair performance. Hence, we are proposing to discount this option and set equivalent QoS standards for each of SMLs 1 and 2.

90% for both SMLs

5.56 As set out above, we consider that a QoS standard at 90% for both SMLs 1 and 2 forms the lower bound for the minimum level of repair quality required to support network access and to provide the certainty telecoms providers need to compete effectively downstream. This level of standard would also improve quality outcomes for consumers relative to the current standards. Also, setting the QoS standard at this level would have the lowest resource uplift requirements relative to other options described and would be below the ceiling at which Openreach submitted it could operate.

Assessment

5.57 Based on the above, we consider that setting equivalent standards at either 90% or 93% for both care levels remain viable options. The choice of the appropriate standard involves the exercise of regulatory judgement in the balancing of the different factors we have identified. Setting a higher standard would provide better outcomes for competition and ultimately, consumers, by increasing certainty to telecoms providers regarding Openreach's performance. A higher standard would also directly benefit consumers in terms of improved quality, although it risks increasing Openreach's costs (which are in turn reflected in the level of regulated charges). This may ultimately have an impact on the prices paid by consumers, which is an aspect to which they attach high importance.

- 5.58 Overall, we have determined it appropriate to place a greater weighting on quality and the need for higher standards as part of our balance. We consider that the 93% represents a proportionate yet stretching target that will result in benefits for competition and customers in the form of greater certainty and improved repair times. The proposed standard is also below Openreach's operational maximum level. Our analysis, which is based on the information we obtained from Openreach, suggests that Openreach can achieve this level of performance within the timeframe of this market review by increasing engineering resources and making some changes to its working practices¹⁰² (some of which we understand it has already begun undertaking¹⁰³).
- 5.59 We consider that a 93% repair standard is justified on the basis that we consider it to be achievable and that it ensures a sufficiently high level of performance against the SLA, thereby meeting the requirement for effective network access. Also, in our view, our proposal strikes an appropriate balance between consumers' reliance on, and expectations of, broadband services, including the harm consumers experience from a loss of service, and the risk that retail prices could rise as a direct result of quality improvements.
- 5.60 In summary, based on the above considerations, we propose to increase the repair within SLA standard to 93% (before deducting any potential allowances for MBORC events). This will require Openreach to resolve 93% of faults for WLR, MPF, and GEA-FTTC services subject to each of SML1 and 2 within contracted timescales. Also, in order to ensure that Openreach is able to deliver a level of QoS to at least the proposed standards, we have incorporated a resource uplift into our charge control modelling.

Quality standards for faults repaired at +5 working days

- 5.61 To determine an appropriate performance standard for repairs that are completed five working days after Openreach's agreed SLA timescales, we have considered Openreach's historical performance against this dimension, as well as its operational capabilities.
- 5.62 In the past five years, UK repair performance at five working days after the SLA deadline expired was highest in 2011/12.¹⁰⁴ As illustrated in Table 5.7, UK performance over that period has varied within a 2 – 2.5% range. A comparison with Openreach's on time repair performance for SMLs 1 and 2 suggests that Openreach has been able to achieve a 20 percentage point higher success rate for repair jobs at +5 days beyond SLA as compared to its repair performance against SLA.

¹⁰² E.g. multi-skilling and providing more tools in the field.

¹⁰³ London Stock Exchange, 2016. 'BT to invest billions more on fibre, 4G and customer service': <http://www.londonstockexchange.com/exchange/news/market-news/market-news-detail/BT.A/12804128.html> [accessed 13 March 2017].

¹⁰⁴ WLR, MPF, and GEA-FTTC for both SMLs 1 and 2. See Annex 6 for distribution curves for these three services combined.

Table 5.7: UK repair performance at SLA +5 days (%)

	2011/12	2012/13	2013/14	2014/15	2015/16
SML1	97.2%	95.5%	95.0%	96.4%	95.7%
SML2	97.4%	95.5%	95.4%	97.3%	96.8%

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016 and the 5th QoS information request to BT of 13 January 2017

- 5.63 With respect to Openreach's operational capabilities, repair work that takes a number of days longer than the SLA to complete is more likely to involve more complex or time consuming tasks, for example civil engineering work. Given our proposed QoS standard of 93% for repairs completed on time for SMLs 1 and 2, it is likely that a proportion of the remaining 7% of faults will be comprised of more difficult repair jobs. We have analysed data provided by Openreach in response to a formal information request and estimated that around 2.7% of tasks are related to civil works. To that end, we consider that imposing a +5 days standard at 100% would be unachievable and, in turn, disproportionate.
- 5.64 Nevertheless, we consider it important to set the level of the standard as close to 100% as realistically possible. We therefore propose that it is reasonable that Openreach is able to complete 97% of repairs (before any consideration of MBORC allowances) within five working days of its target date. This is consistent with historically achieved performance for repairs in this timescale, and also allows for the difficulty that Openreach might face in resolving the remaining 3% in a timely manner. Completing 97% of tasks by +5 days should also ensure that the vast majority of consumers do not experience a repair time that they consider unacceptable.
- 5.65 We consider that setting a 97% standard for repairs completed five working days beyond the SML1 and 2 timescales is proportionate in the light of our proposal to allow for an increase to Openreach's engineering resources to achieve the higher on time repair standards we are proposing. As standards and performance against the SLA rise over time, and as Openreach's workforce grows and becomes more skilled in multiple areas of repair work, we consider that a number of faults will be resolved within or close to the higher on time repair standards such that delivering to 97% at +5 days will be achievable. Further, the proportion of tasks beyond the 93% SML1 and 2 repair standards that Openreach will be required to achieve is broadly similar to that Openreach achieves today and we therefore do not intend to include a resource uplift within our charge control modelling to specifically reflect this aspect of our proposals.

Question 5.3: Do you agree with the proposed levels of the repair standards? Please provide reasons and evidence in support of your views.

Our glidepath proposals

- 5.66 Our analysis of the operational constraints on Openreach suggests that achieving a target performance of above 90% for on time repair is largely dependent on additional resources, while improvements above this level are likely to require further training for engineers and some operational improvements.

- 5.67 We recognise that, if Openreach recruits a number of additional technicians in one year, there will be a lead time before these new starters are trained to a sufficient level to be able to successfully carry out jobs in the field.¹⁰⁵ We also understand that Openreach is currently running a programme of multi-skilling staff in order to reduce operational constraints on performance.
- 5.68 The combined effect of the recruitment and training is that Openreach is likely to take more than one year to be able to achieve the repair standards which we are proposing for the last year of the review period. Based on our analysis of recent performance, we consider that imposing the final year standards immediately would give rise to a significant risk of failure. For this reason, we consider that it would be appropriate to allow for a glidepath that gives Openreach adequate time to implement any necessary changes to its operations and to become sufficiently resourced with skilled staff to comply with our proposed third year standards.
- 5.69 We have therefore proposed a glidepath that requires a modest improvement in the first year of the charge control period (which is consistent with current UK average performance¹⁰⁶), a significant increase to 90% in the second year, and for Openreach to achieve the target of 93% in the final year of the control. This glidepath allows Openreach to take longer to achieve the last 3% of the improvement, and it also factors in the progress we expect Openreach to make with its fault volume reduction programme, resourcing efforts, and investments in multi-skilling based, all of which are based on Openreach's own timetable (see Table 5.8).

Table 5.8: Proposed repair within SLA standards showing glidepath (excluding MBORC allowances)

QoS standard	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA timescales	80%	83%	90%	93%

- 5.70 With respect to the +5 days standards, we propose to set the target for the first year of the control period at a level broadly equivalent to current performance. We consider that this has the benefit of allowing Openreach to focus on delivering against the on time repair standards in the first year while also moderating the risk of a degradation in performance in the 'short tail' (i.e. repairs completed a few days beyond their SLA). By the second and third year of the review period, we would expect Openreach to have increased resources appropriately in order to meet the on time repair standards for SMLs 1 and 2, which should be reflected in its performance at five days beyond those agreed timescales. We therefore propose a linear glidepath up to 97% in the third and final year – see Table 5.9.

¹⁰⁵ Openreach refer to this as "time to competence".

¹⁰⁶ Figures shared with Ofcom and the OTA2 by Openreach indicate that between 1 November 2016 and 20 January 2017 year-to-date UK performance against the current repair standards was 84.1% for SML1 and 80.0% for SML2. Also, Openreach's mandatory non-discrimination KPIs show that average UK performance for GEA-FTTC repairs at SML2 across the FAMR period has been 79.5%.

Table 5.9: Proposed standards for repairs at SLA +5 days showing glidepath (excluding MBORC allowances)

QoS standard	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA +5 days	N/A	95%	96%	97%

Question 5.4: Do you agree with our proposed glidepaths? Please provide reasons and evidence in support of your views.

Other considerations relating to the design of our proposed QoS standards

- 5.71 In this section, we consider a number of aspects to the design of the on time repair and repair at +5 days standards, and how we propose to measure compliance with them.

Compliance periods

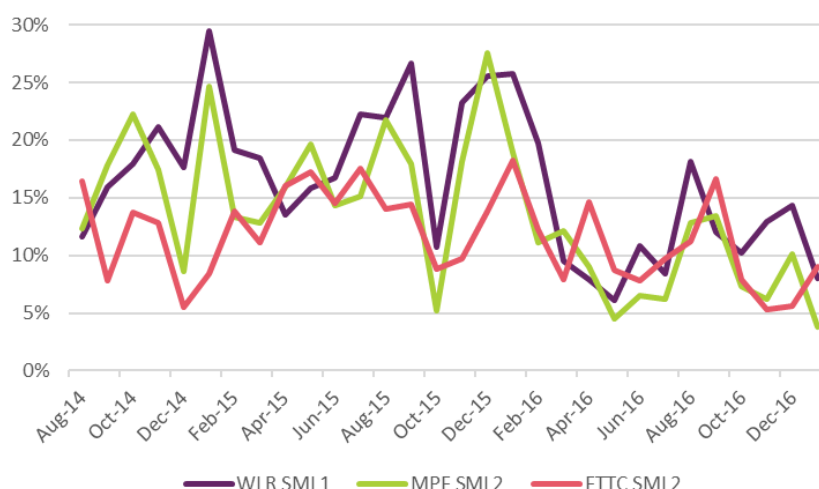
- 5.72 The 2014 FAMR determined it appropriate to measure compliance with the repair standards on an annual basis. We considered that, while it is desirable for Openreach to achieve a consistent level of service throughout the year, there are typically periods in each year when conditions are more challenging and during which there can be significant volatility in fault volumes. By setting standards on an annual basis, Openreach is able to balance periods of high repair demand with periods of low demand, for example where weather is benign, and also to resource itself more efficiently.
- 5.73 We do not consider that there is a reasonable basis to depart from this approach and therefore propose that compliance should be assessed annually. The first assessment period for the repair QoS standards should therefore be 12 months beginning 1 April 2018. Subsequent periods will begin 1 April 2019 and 1 April 2020, respectively. Imposing the standards in this way also aligns our proposed remedies with the WLA market review and charge control periods.

Geographic application

Repairs within SLA

- 5.74 The 2014 FAMR concluded that the standards should apply to each of Openreach's ten geographic regions, and that the same target should apply in each region. We believed that this would ensure consistency in the standards we set without imposing disproportionate requirements on BT.
- 5.75 As shown by Figure 5.10 below, Openreach's monthly repair on time performance (for WLR, MPF, and GEA-FTTC) often varies considerably between the highest performing and lowest performing of its ten geographic regions. The chart indicates that the performance difference is generally between 10% to 20%, but can be as high as 30%. Hence, we are concerned that a national standard for on time repair could be met by Openreach performing very well in some areas of the UK, but allowing performance to degrade in other regions.

Figure 5.10: Performance difference between the highest and lowest performing regions in the UK for WLR, MPF, and GEA-FTTC



Source: Openreach mandatory non-discrimination KPIs

- 5.76 To support good outcomes for competition and consumers, we consider that it is important that standards on repairs delivered to the SLA apply in sufficient granularity to ensure a consistency in repair performance throughout the country. We also consider that this approach reduces the risk of discrimination between regions, including where the mix of services varies from region to region, and is consistent with Ofcom's duties to each of the UK nations under the Act. However, while applying standards to a greater number of areas could yield greater consistency, this approach may increase the cost and complexity of BT's compliance, and affect the statistical reliability of the reported results.
- 5.77 We therefore propose that the repair within SLA standards for SMLs 1 and 2 repairs apply to each of Openreach's ten regions. We consider that this strikes an appropriate balance between ensuring consistently good outcomes for customers across the UK and the costs and burden associated with setting too granular a level of compliance.

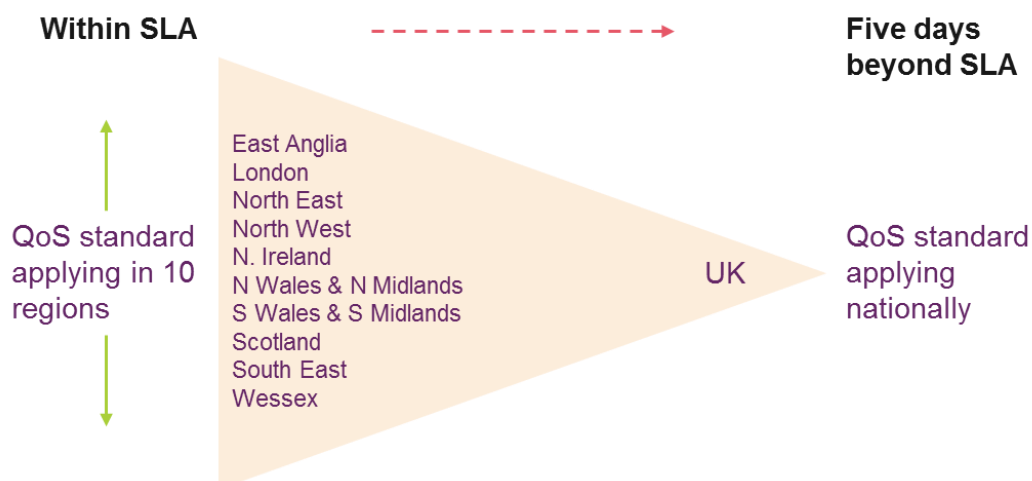
Repairs completed five working days over agreed timescales

- 5.78 In contrast, we propose to assess compliance with the +5 days standards on a national basis. The volume of repairs completed at five working days over SLA is materially lower than those repaired on time. In some regions this could lead to a greater volatility in Openreach's performance due to statistical variation, which could reduce Openreach's ability to reliably demonstrate performance at the proposed standard level of 97%.
- 5.79 We do not expect there to be much scope for Openreach to significantly vary repair operations on a geographical basis so as to achieve different performance outcomes given our proposal to assess on time repair performance on a regional basis, which would require Openreach to adequately resource all geographic areas. However, some variation between regions and within regions (i.e. between urban and rural areas) could occur that this is not fully within Openreach's control where difficult repairs involving civil work are affected by the local environment. Consequently, we consider that assessing the +5 days standard on a national basis will afford Openreach a degree of operational flexibility in meeting the target and that this is

proportionate as these cases typically include more difficult repair jobs, which can require specialist skills or equipment which could be difficult to make available to all parts of the country.

- 5.80 We therefore propose to measure compliance with the on time repair standards regionally and the repair within the SLA +5 days standards nationally. Figure 5.11 below illustrates how we intend to implement our proposals:

Figure 5.11: Proposed geographic application of the repair QoS standards



Question 5.5: Do you agree with our proposed compliance periods and geographic applications of the repair standards? Please provide reasons and evidence in support of your views.

Inclusion of *force majeure* affected services in the QoS standards

- 5.81 Within any given year, MBORC events can occur in any region and cause Openreach to fail its repair targets. These can include, among other things, extreme weather events and criminal or negligent damage to the Openreach network by third parties.
- 5.82 In the 2014 FAMR, we took account of evidence that there was a reasonable prospect of *force majeure* events of such a magnitude for which no preparation by Openreach would be sufficient. As a result, we considered making allowances for events that are outside Openreach's control when assessing compliance with the QoS standards. We determined it appropriate to limit the scope for Openreach potentially 'abusing' the MBORC regime while also ensuring that the risk of Openreach failing the standards for reasons genuinely outside its control was mitigated. We therefore undertook a comprehensive study of events that resulted in late repairs, including extreme weather events. Ultimately we decided to allow for two types of MBORC events: Local MBORCs¹⁰⁷ and High Level MBORCs.¹⁰⁸
- 5.83 For Local MBORC events (the majority of total MBORCs), we did not propose to analyse individual BT declarations regarding such events. Instead, we applied a 3% *force majeure* adjustment to the repair standards. Compliance with the MBORC-

¹⁰⁷ E.g. criminal, intentional, or negligent damage to the network.

¹⁰⁸ E.g. incidents affecting over 2,000 lines, incidents which are/are likely to become the subject of regional or national media interest, and anything likely to have a significant impact on the BT and/or Openreach brand.

adjusted standard is then assessed by counting all late repairs without exception for Local MBORCs. We based the 3% allowance on an analysis of MBORC-related events during 2012/13, which we considered to have been a year of particularly poor weather and, accordingly, offered a reasonable proxy for an upper estimate of the potential for MBORC to impact on service delivery.

- 5.84 In addition, we allowed Openreach a time-limited exemption in two areas of the UK per year for late repairs due to High Level MBORC events.¹⁰⁹ To apply for High Level MBORC exceptions, Openreach is required to provide Ofcom with details of the event together with the justification for the length of the declaration. This was intended to allow for the fact that in any given year, particular regions may suffer from much more extreme weather than the UK “average”. Further, as we cannot accurately predict which regions may be impacted by such events from one year to the next, we considered it appropriate to allow for flexibility as to which two regions per year Openreach may apply the High Level MBORC allowance, should this be necessary and appropriate, and considered that this is likely to support effective retail competition.
- 5.85 In analysing the occurrence of MBORC events since the 2014 FAMR (see Tables A6.47 and A6.48 in Annex 6), we have observed a reduction in the proportion of fault repairs exceeding SLAs, which were also impacted by MBORCs. This has been, for the most part, during benign years in terms of weather, and Openreach’s operations have not had to react to weather events of the same scale as those analysed for the purposes of the FAMR. Still, as weather-related incidents are by their very nature unpredictable, we consider that the potential remains for such events to affect a large number of lines simultaneously and to significantly disrupt operations.
- 5.86 We have received a stakeholder submission regarding MBORCs, which suggests that the prevailing allowances are too generous. We recognise that, in a normal year, the MBORC allowance might exceed the number of MBORC events that occur. However, we continue to consider it appropriate to set an allowance based on a ‘worst case’ scenario in order to provide certainty to Openreach that extreme weather-related events do not have an unintended consequence in its ability to meet its regulatory obligations.
- 5.87 We therefore consider it appropriate to follow the same approach taken in the 2014 FAMR and propose to use the current 3% as an upper bound on which to base the fixed *force majeure* allowance for the on time repair standards. In addition, we propose to retain High Level exemptions in up to two regions per year, for up to eight weeks per event.
- 5.88 For the repair standard at +5 days, we propose to grant equivalent exceptions for High Level MBORCs but do not propose to include a fixed percentage allowance for Local MBORCs. In the light of our proposals above to assess compliance against these standards on a national basis, we consider that localised, small-scale events are relatively less likely to have an impact on BT’s on time repair performance measured across the UK and, in turn, success against the QoS standards.

Question 5.6: Do you agree with our proposal to continue to make an allowance for force majeure in the repair QoS standards? Do you agree with our proposals to use

¹⁰⁹ This is limited to a maximum of eight weeks in a year in a given geographic region, and Openreach could use the exemption in no more than two regions. Work undertaken for Ofcom by Cartesian for the purposes of the 2014 FAMR showed that the highest average period for a Senior Operations Manager (SOM) area to be impacted by an individual MBORC event in 2012 and 2013 was 58 days.

3% as the Local MBORC allowance and to retain exemptions for High Level events? Please provide reasons and evidence in support of your views.

Service level guarantees (SLGs)

- 5.89 Aside from regulatory quality standards, we ensure that Openreach also faces financial incentives both to avoid delays and to minimise any such delays which may arise. These incentives are contained within the SLA and SLG provisions of Openreach's wholesale contracts with telecoms providers for providing key network access services.¹¹⁰ Openreach is required by our SMP regulation to provide SLAs and SLGs within those contracts, including specific service level commitments to which SLGs apply relating to repairs such as fault repair times and attending fault repair appointments.¹¹¹
- 5.90 Under these contractual SLAs, BT agrees to pay telecoms providers a set amount for each day¹¹² of delay in respect of its orders beyond the SLA as set out in the terms of its contracts. For example, under BT's contract for the supply of MPF, BT agrees to pay telecoms providers fixed compensation if the completion of any MPF fault repair is later than the contractually agreed timescales as per the relevant SML. This is calculated at £8 per working day or part working day from the working day after the SLA timescales have passed.
- 5.91 However, the payment period is currently limited to a specified maximum number of days – specifically 60 consecutive working days in respect of late MPF repairs. We are concerned about instances where customers are left without service for extended periods of time. We have therefore considered the incentives on Openreach to address delayed repairs, including the possibility of using SLGs to protect consumers falling outside the scope of our QoS standards.
- 5.92 In 2015/16, [3<] % of all completed fault repairs¹¹³ took more than 60 working days over SLA to resolve. While this percentage may appear small, the figure in absolute terms equates to [3<] fault repairs per month, which we consider represents a material number of consumers waiting excessive amounts of time for a repair to take place. As telecoms services (broadband in particular) are increasingly becoming an essential part of people's lives, prolonged service outages could lead to significant consumer harm. Further, that harm from being without broadband or fixed voice services does not end at 60 days, but beyond this point there are limited incentives on Openreach (including a lack of financial pressure) to resolve outstanding faults given its SMP. In addition, we consider that, as a repair gets closer to the 60 day mark, Openreach's incentives to resolve the fault begin to erode, as the maximum total SLGs it could still be liable for decline on a daily basis.
- 5.93 Our data analysis suggests that, of completed fault repairs¹¹⁴ which took more than 60 working days over SLA to resolve, 37% are within Openreach's control¹¹⁵ and that

¹¹⁰ <https://www.openreach.co.uk/orpg/home/products/contracts/contracts.do> [accessed 14 March 2017].

¹¹¹ See Section 8 and proposals to impose Reference Offer obligations on BT in our 2016 NMR Consultation and March 2017 WLA Consultation.

¹¹² Day or working day depending on the contract.

¹¹³ WLR, ISDN30, ISDN2, MPF, SMPF, GEA-FTTC and GEA-FTTP faults.

¹¹⁴ WLR, MPF and GEA-FTTC faults in 2015/16.

¹¹⁵ High-level clear codes 4 (Main Distribution Frame), 22 (DSLAM mains power repair), 23 (NGA proactive repair (FTTC cabinet)), 83 (Radio), 172 (Other Reports (Local line)), and 180 (OTHER).

there is scope for the repair of those faults to be completed more quickly. A further 34% involve underground work¹¹⁶ which have limited scope for improvement, although only 2.4% were impacted by MBORC declarations and were therefore, by definition, outside of Openreach's reasonable control.

- 5.94 We consider that faults that are not resolved within a timely manner risk undermining the effectiveness of the repair SLAs in supporting the effectiveness of the network access remedy and, as such, it is appropriate that we intervene to incentivise Openreach to take action in order to make improvements in this area. Openreach has shared with us its plans to tackle the group of repairs beyond the SLA that fall into the 'aged tail'.¹¹⁷ We welcome these plans but remain concerned that plans to deal with this issue may be deprioritised in the light of other operational initiatives, especially in light of the higher quality standards we are proposing. We therefore consider a change to the SLG cap to be necessary and have looked at two possible options, as set out below.

Extending the SLG cap

- 5.95 We consider that extending the 60 day cap in principle would provide incentives for BT to complete repairs for an additional number of customers where otherwise those incentives would not exist and would increase the incentives to complete repairs which approach the existing cap. For example, doubling the current SLG cap to 120 payable days would reduce the number of open repair jobs at the cut-off point for the compensation cap to [3<] cases per month.¹¹⁸ Further, our estimates indicate that extending the cap to 120 payable days has the potential to increase annual SLG costs to BT by less than £200,000. However, BT would not be liable for the totality of this exposure due to the various exclusions contained within its contracts with telecoms providers to reflect matters that are not within its control.¹¹⁹

No SLG cap

- 5.96 As stated in Section 3, in our view it is not appropriate to adopt a general principle as regards the appropriateness of compensation caps but to consider the particular circumstances. Removing the current cap would ensure that, in future, BT has increased incentives to repair faults that experience delays of 60 or more days over SLA. Specifically, in contrast to the status quo, there would be a financial incentive on BT to complete these repairs. Our estimates indicate that not having a cap on late repairs SLGs has the potential to increase annual SLG costs to BT by less than £600,000 compared to the counterfactual of a 60 day cap. Again, we do not expect that BT would be liable for the total amount set out above as, in practice, a number of repairs would likely be outside of its control and, therefore, in line with its contracts with telecoms providers, SLGs would not apply. The SLGs would therefore maintain incentives on Openreach to undertake repairs promptly where it remains in its control to do so.

¹¹⁶ High-level clear codes 81 (Underground – exchange-side) and 82 (Underground – distribution-side).

¹¹⁷ Openreach considers a fault repair more than 30 calendar days beyond SLA as falling into the aged tail.

¹¹⁸ Based on 2015/16 fault repair volumes.

¹¹⁹ E.g. delays caused by Openreach, by no fault of its own, not being possible to access, or carry out any necessary work at, the relevant premises because a consumer is not present.

Assessment

- 5.97 Based on the above, we consider the arguments to be finely balanced. We consider that the existing level of caps on SLGs is no longer appropriate and risks undermining the SLA/SLG regime as a component of fair and reasonable network access. Theoretically, the longer the cap the greater the incentive on Openreach to address delayed repairs. However, a longer cap also risks increasing BT's costs (hence BT's previous concerns about unlimited liability) and the potential for avoidance tactics or gaming.
- 5.98 As set out in Section 3, we consider that the justification for retaining caps on compensation is weak, even where these caps are set to only capture the most extreme cases. We consider that removing the cap in its entirety maximises the benefit to competition, telecoms providers, and consumers by ensuring Openreach resolves all customer faults attributable to its network. We place particular weight on this factor.
- 5.99 Set against the benefits to competition, there are potential costs to BT. We would be concerned if the potential financial exposure to Openreach was disproportionate in light of the competition benefits identified above. Using data obtained from BT using our statutory information gathering powers, we have estimated the increase in repair SLG costs that BT could be liable for if SLG caps for repairs were removed to be under £600,000,¹²⁰ which very much reflects the upper bound of the potential increase in annual costs. We have not calculated a corresponding lower bound; however, we consider that the liability to which BT would be exposed would be considerably lower in reality than the figure stated above because of certain contractual exclusions to compensation payments.
- 5.100 Having regard to the level of costs identified above and the potential improvements in the effectiveness of the SLA/SLG regime, we are proposing to require Openreach to remove the existing 60 cap on SLG payments. We consider that this will ensure that the incentive properties of SLGs do not diminish and will encourage Openreach to effect material improvements in the long tail, thereby reducing extreme delays. A notification of our proposed direction is set out in Annex 8.

Question 5.7: Do you agree with our proposal to make the payment period for late repair SLGs indefinite? Please provide reasons and evidence in support of your views.

Provisional conclusions

- 5.101 In the above sub-sections we have outlined our proposed remedies to address the repair QoS issues arising out of BT's SMP. In this regard, we have reviewed the effectiveness of the existing regulatory framework insofar as it impacts on quality¹²¹ and have proposed measures to ensure that BT has the right incentives to deliver (via Openreach) the quality its customers and end users require.
- 5.102 The following section of this consultation sets out our proposals for regulating BT's service performance in respect of installations. We then go on to describe the

¹²⁰ This calculation is based on the product of the annual volume of repairs taking more than 60 working days over SLA to complete and the mean time to repair for those repairs. This is subsequently multiplied by £8 which represents a proxy for the SLG for each late repair.

¹²¹ These elements of the framework are service standards, transparency obligations, and SLGs.

transparency requirements we are proposing to set on BT to ensure the appropriate level of visibility around quality.

Question 5.8: Do you have any further comments on our proposals for regulating BT's service performance for repairs? Please provide reasons and evidence in support of your views.

Section 6

Regulating BT's service performance for installations

Introduction

- 6.1 In Section 3 we set out our concern that, in the absence of appropriate *ex ante* quality of service (QoS) regulation, there is a risk that BT has the incentive and the ability to, among other things, install WLR, MPF and GEA-FTTC services at a level of performance which could impair competition in the markets for fixed voice and broadband services, for example, by discouraging customers from switching between rival telecoms providers. The division of BT that installs and maintains connections to its network on behalf of telecoms providers is called Openreach.¹²²
- 6.2 Our assessment and proposals for appropriate *ex ante* regulations to remedy our above concern are based on the reasoning and evidence set out in this section (including references made to Annex 6 on Openreach's QoS performance and Annex 7 on resource implications) and the approach to regulation which we have set out in Section 3.
- 6.3 In Section 8 we set out why we consider that the regulations we propose would achieve our statutory duties and satisfy the relevant legal tests. In reaching these proposals, we have also taken account of our regulatory experience from previous market reviews, recent developments in the wholesale fixed access markets (particularly based on information from Openreach and telecoms providers about quality of service and from customers in response to new research we have commissioned), and also expected developments over the forward look period.

Summary of our proposals

- 6.4 In the Narrowband and WLA market reviews, we have proposed to impose an SMP condition requiring BT to comply with such quality of service requirements as we direct from time to time. Here we are proposing to exercise that power to impose a direction setting QoS standards for installations,¹²³ as summarised below.

Quality standards for installations

- 6.5 We are proposing to set directions which require BT to comply with quality standards in relation to:
- a) on-time installations, where we propose an increase from the current level which is set at 90% to 95% by 2021. We further propose to apply this requirement to Openreach's GEA-FTTC installations (in addition to WLR and MPF installations); and

¹²² Openreach does not have an operational presence in Northern Ireland; instead, BT Ireland operates and maintains the Northern Ireland network on behalf of BT Group. Further information is at <http://ask.ofcom.org.uk/help/telephone/NIopen>.

¹²³ We set out what we mean by installations in Section 2.

b) installation appointments, where an Openreach engineering visit is required to install WLR, MPF and also GEA-FTTC¹²⁴, where we propose:

- a reduction in the lead time for the first available appointment date offered by Openreach from within 12 working days to within ten working days by 2021; and
- a requirement on Openreach to offer an appointment date within ten working days 90% of the time rather than the current 80%.

6.6 We propose that compliance with the above quality standards for installations will be assessed annually over each of ten UK geographic regions¹²⁵ (as is the case currently), but by measuring the combined performance across WLR, MPF and GEA-FTTC rather than for each service.

6.7 We have also considered an appropriate glidepath for Openreach to achieve these new quality standards for installations, which are summarised in Table 6.1 below.

Table 6.1: Proposed quality standards for WLR, MPF and GEA-FTTC installations over the 2018 to 2021 market review period

	Current standard	Proposed new standards		
		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
% of installations to be completed by the committed date (Adjusted standard for <i>force majeure</i>)	90% (89%)	92% (91%)	92% (91%)	95% (94%)
		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Working days within which first date offered for installation appointments	12	12	12	10
		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Frequency with which regulated installation appointment date must be offered (Adjusted standard for <i>force majeure</i>)	80% (79%)	90% (89%)	90% (89%)	90% (89%)

¹²⁴ For the avoidance of doubt, we mean any appointments made for an engineer visit whether in relation to orders for GEA-FTTC installations at the street cabinet only and/or appointments for an engineer visit to the customer's premises.

¹²⁵ Based on Openreach operational regions, the ten UK geographic regions are Scotland, North East, North West, North Wales & North Midlands, South Wales & South Midlands, Wessex, South East, London, East Anglia and Northern Ireland. A breakdown of each of these regions by exchange name and identifier is available at https://www.ofcom.org.uk/_data/assets/pdf_file/0022/81067/schedule_3_annex_29.pdf.

Service Level Guarantees (SLGs) for installations

- 6.8 We have set out proposals to remove the cap of 60 payable days on Openreach's payments of late installation SLGs in its contracts. We consider that this measure will ensure that Openreach remains incentivised to complete installation orders which experience significant delay.¹²⁶

Structure of this section

- 6.9 This section first discusses our aims in relation to two key aspects of performance: certainty that Openreach will deliver on time as promised and how quickly they can complete installations. We then consider the levels of service performance we think Openreach should meet, and how this performance should be measured for compliance, such as the assessment period, the geographic application and allowances for *force majeure* events. Finally, we consider proposals around late installations and newly installed services not working properly, including SLGs.

Aim and effect of regulation

Certainty around installations

- 6.10 As set out in Section 3, the primary focus for our approach to this review in relation to fixed line installations is on the competition benefits arising from improved certainty, by which we mean:
- certainty that installations will be completed on time, i.e. an increase in the proportion of orders for connections that are installed on the date agreed between Openreach and its telecom provider customers; and
 - certainty that orders for installations requiring an engineer appointment will be offered a timely appointment, i.e. an increase in the proportion of orders which must be offered a timely appointment (where required).
- 6.11 We also consider other aspects of certainty including Openreach missing appointments and completed installations that do not work as expected. Together with late installations and delays in appointment availability, these issues cause frustration, inconvenience and costs for telecoms providers and their customers, thereby undermining the effectiveness of the core network access remedy.

Speed of installations

- 6.12 We have also considered the extent to which, in addition to ensuring certainty around installations, it would be appropriate to reduce their timescales.
- 6.13 In Section 3 we discuss the negative effects of a poor installation experience on customers and on telecoms providers and competition. We also assess the results from the 2017 Jigsaw survey, which indicates that most residential customers consider a wait of up to seven calendar days until the first suitable appointment for an engineer to visit to be reasonable and a wait of ten calendar days or more to be unacceptable. On average, Openreach is currently offering telecoms providers a first available appointment at around eight working days for WLR and MPF installations

¹²⁶ Typically, these are installation orders which involve civil works to provide a line to the customer's home or business premises.

that require an engineer visit.¹²⁷ However, the average time to install WLR and MPF orders which require an engineer visit currently takes over 14 working days¹²⁸ and, including WLR and MPF orders which do not require an engineer visit, the average is still about 11 working days.¹²⁹ On average, therefore, the wait for an installation order to be fulfilled is taking at least twice as long as customers indicate is reasonable. These findings suggest that current timescales have the potential to harm competition by deterring switching.

- 6.14 However, the speed with which Openreach completes installation orders is often constrained by factors outside of its control. These factors include consumer protection regulation such as General Condition 22.¹³⁰ This general condition, and related industry best practice, require a minimum of ten working days for the installation of a service transfer for customers that are switching between telecoms providers while remaining connected to the Openreach network. This regulation is designed to protect customers from being switched without their agreement ("slammed") and undermining confidence in switching. About 23% to 25%¹³¹ of all Openreach installations are affected by this rule.
- 6.15 The lead times of telecoms providers can also constrain installation times. This includes how quickly telecoms providers place their installation orders with Openreach and how quickly they dispatch home equipment (modems/routers) to their customers. Moreover, some customers choose to delay their installation dates, for example to a more convenient appointment date (where an engineer visit is planned) or to schedule their installation date to coincide with the date of moving house or business premises.
- 6.16 Broadly, the speed of installations and the extent to which Openreach's performance may influence installation timescales vary depending on whether the installation requires an appointment for an engineer visit or not.

Speed of installations requiring an appointment for an engineer visit

- 6.17 Around a third (between 30-40%¹³²) of orders require an Openreach engineer visit to complete the installation, and this often means making appointments with customers to provide access to the home or business to be connected. Openreach making timely appointments available to its telecom provider customers is an important factor driving customer experience and an area in which Openreach has performed poorly

¹²⁷ Openreach, 2017. *Our performance. Homes and smaller businesses.*

<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 10 March 2017].

¹²⁸ Openreach, 2017. *Our performance. Homes and smaller businesses.*

<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 10 March 2017].

¹²⁹ See Figure A6.14 in Annex 6.

¹³⁰ Ofcom, 2015. *General Conditions of Entitlement, General Condition 22 ("GC22") for Service Migrations and Home-moves. Extract from the Consolidated Version of General Conditions of Entitlement as at 28 May 2015.*

https://www.ofcom.org.uk/_data/assets/pdf_file/0027/86274/General_Condition_22_Service_migrations_and_Home-moves.pdf.

¹³¹ Openreach email to Ofcom dated 6 December 2016. The figures are the lowest and highest quarterly percentage of WLR, MPF, SMPF and GEA-FTTC provisions combined, which were subject to the Notification of Transfer process, over the period Q1 2015 to Q3 2016.

¹³² See Figure A6.4 in Annex 6.

in the past.¹³³ In 2014, we imposed a requirement on BT to offer a first available engineer appointment within 12 working days of the corresponding order being placed, in line with the contractual service level agreement (SLA) that was in place at the time.

- 6.18 Openreach data shows that orders requiring appointments for an engineer visit usually take longer to complete, currently over 14 working days¹³⁴ on average. This is because telecoms providers select some appointments which are later than 12 working days for various reasons, including customer demand for later appointment dates. Recognising that telecoms providers and their customers may sometimes choose later appointments, we nevertheless consider Openreach's service performance in making timely appointments available for installation orders to be a key factor in the time to install those orders.
- 6.19 Openreach data also shows that, when it offers an installation appointment within six working days of an order being placed, fewer than 50% of these appointments are accepted.¹³⁵ We do not have evidence that enables us to determine whether this is mainly because earlier appointments are rejected by telecoms providers because they are not ready (e.g. their arrangements for the dispatch of home equipment takes longer than six days), because these earlier appointments are rejected by customers themselves, or due to a combination of both (or possibly some other reason). Nevertheless, this evidence suggests that the benefits of further shortening the timescales for installation appointments may be limited at present, although changes in customer demand and retail practices may lead to telecoms providers seeking shorter lead times from Openreach in future.

Speed of installations that do not require an engineer visit

- 6.20 Two-thirds (between 60-70%¹³⁶) of all installation orders do not require an engineer visit, and the average time to install these orders is currently around ten working days.¹³⁷ In the case of non-appointed orders there is typically less engineering work required for Openreach to have to co-ordinate and carry out to deliver the services required. For example, in some instances the telecoms provider's order only requires some reconnection work in the exchange, for which the Openreach minimum lead time is around four working days, and, where the order only requires the reactivation of an existing line, the lead time is negligible.¹³⁸
- 6.21 We think that the time to install these orders is not materially constrained by factors relating to Openreach's service delivery capability, but is rather driven by other factors (as mentioned above), including the regulatory ten working day lead time for notifying transfers to customers when switching between telecoms providers; the

¹³³ Ofcom, 2014. Statement. *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*. P.269. Table A17.3.
https://www.ofcom.org.uk/data/assets/pdf_file/0026/78812/annexes.pdf.

¹³⁴ Openreach, 2017. *Our performance. Homes and smaller businesses*.
<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 10 March 2017].

¹³⁵ See Figures 6.9 to 6.11 below.

¹³⁶ See Figure A6.4 in Annex 6.

¹³⁷ Openreach, 2017. *Our performance. Homes and smaller businesses*.
<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 10 March 2017].

¹³⁸ Openreach, 2016. *Wholesale Local Access market review and charge control review 2016/17. Openreach provision performance measures – ATI and FAD. Update for Ofcom*. November 2016. Slide-deck. Slide 9.

speed of telecoms providers' own processes for setting up services for their customers; and customers' own requirements as to when they want their service installed. In view of this we do not consider it necessary to impose regulation for installations which do not require an engineer visit to the home or business premises.

- 6.22 Nevertheless, as we mentioned above, changes in customer demand and retail practices may lead telecoms providers to seek shorter lead times from Openreach, including for installation orders that do not require an engineer visit. We expect Openreach to be responsive to its customers' changing needs and review its lead times for activities which contribute to the time to install such orders.

Quality standards for on-time installations

How and why we set a 90% quality standard level for on-time installations in 2014

- 6.23 In our 2014 FAMR Statement we decided to set the quality standard for on-time installations at 90%¹³⁹ for each year of the market review period (2014 to 2017). This meant that a minimum of 90% of all orders to install WLR and MPF connections must be completed on the date agreed with the telecoms provider who ordered it.
- 6.24 We considered that, in setting a standard for on-time installations, we would not want to see a deterioration of Openreach's delivery performance. On-time installation performance (measured as the percentage of provision orders for WLR and MPF completed by the agreed delivery date) had been consistently above 90% during 2009 to 2013. We therefore considered that the lower bound for a QoS standard for this measure should be 90%.
- 6.25 We decided that Openreach's observed performance in 2009/10 of 93% for WLR and MPF represented an appropriate upper bound for a QoS standard for on-time installations, having taken into account Openreach's evidence of 'glass ceilings' (i.e. an upper operational performance limit) and evidence from key performance indicators (KPIs).¹⁴⁰
- 6.26 As Openreach had consistently performed at or above the lower bound level of 90% since 2009, we were confident that setting the standard at this level was achievable, while also being close to our judgement as to the upper limit of delivery performance at that time. We were not, at that time, confident that Openreach could achieve the upper bound in all conditions. We further considered that a standard for on-time installations of 90% would not have any impact on costs, given that it was already being achieved with existing resources.

Openreach's actual performance against the 2014 standard of 90% for on-time installations for WLR and MPF

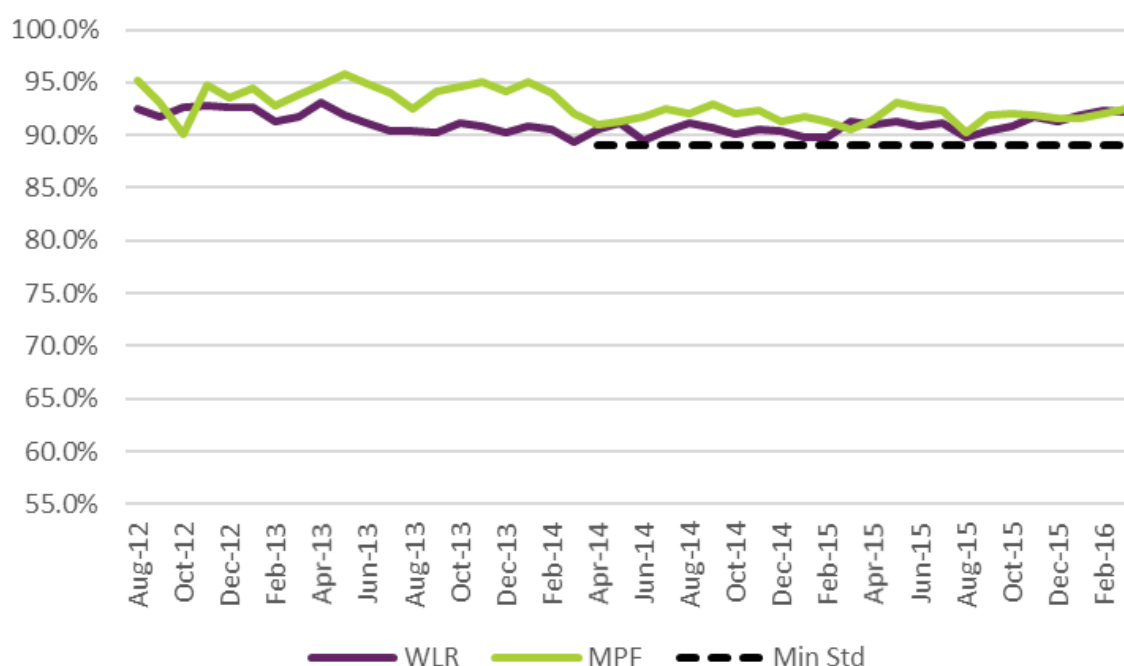
- 6.27 We have set out our provisional assessment of Openreach's observed performance in relation to on-time installations in Annex 6. This assessment looks over the period from April 2009 through to December 2016.

¹³⁹ The standard was set at 89% to provide Openreach an allowance of 1% for *force majeure*.

¹⁴⁰ The KPIs exclude failures caused by customers or other telecoms providers; in relation to installations this includes cases where there is no access to customer premises.

- 6.28 As shown in Figure 6.2 below, Openreach has, to date, complied with the annual standard for on-time WLR and MPF installations which we set at 90% from April 2014 in the 2014 FAMR Statement. Over this period Openreach performance has remained fairly flat, despite Openreach's public commitments in its September 2015 'Our Charter'¹⁴¹ to do much better than Ofcom's standards (see below). Our evidence suggests that performance for on-time WLR and MPF installations has remained between 90% and 95% since at least August 2012.

Figure 6.2: WLR and MPF orders provisioned on time, all orders (%)



Source: Ofcom analysis of BT data submitted in response to the third QoS information request to BT of 19 July 2016

Openreach's 'Our Charter' aim to achieve on-time installations of 95% by 2017

- 6.29 As mentioned above, in September 2015, Openreach made its own public commitments to its customers. Openreach launched 'Our Charter'¹⁴² which *inter alia* states:

"Our Charter summarises our commitments, the investment we're putting into our digital future and how we're raising standards to meet the demands of consumers and businesses."

¹⁴¹ Openreach, 2017. *Our Charter*.

<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-charter.aspx> [accessed 13 March 2017] and Openreach, 2015. *Our Charter*.

<https://www.btplc.com/Sharesandperformance/Presentations/Presentations/keycompanyannouncements/downloads/OpenreachCharter.pdf> [accessed 23 March 2017].

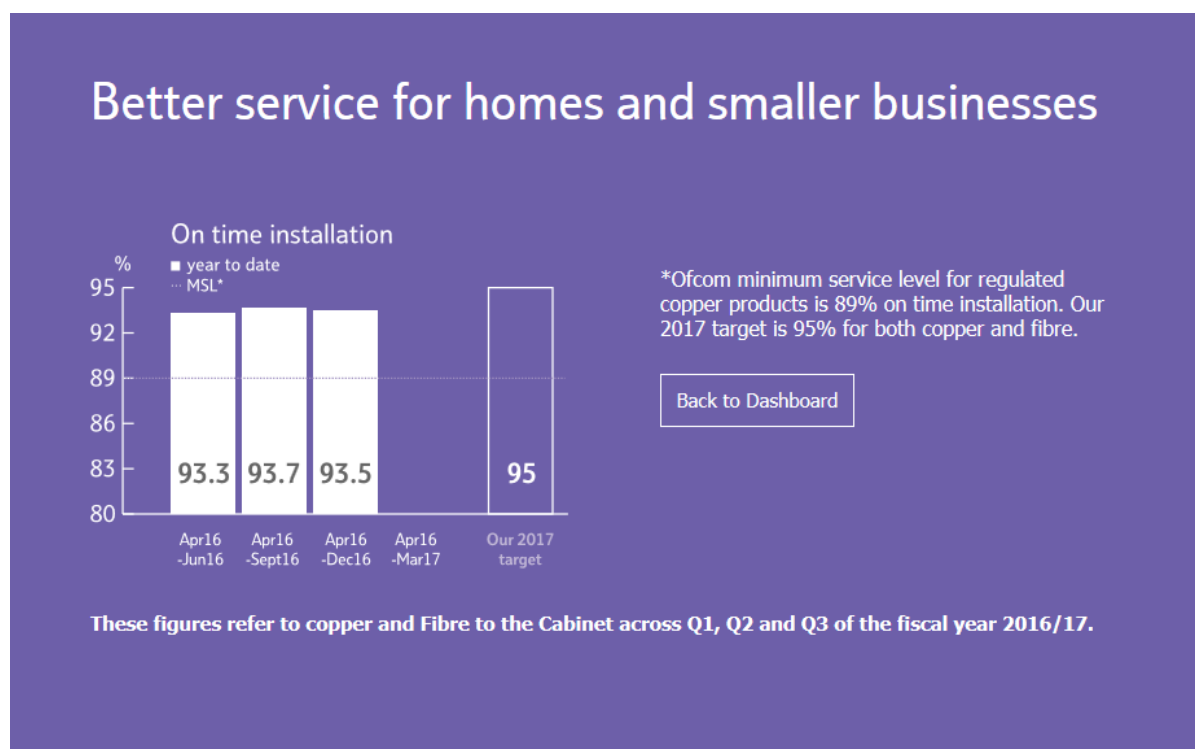
¹⁴² Openreach. *Our Charter*. <https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-charter.aspx> [accessed 13 March 2017] and Openreach, 2015. *Our Charter*.

<https://www.btplc.com/Sharesandperformance/Presentations/Presentations/keycompanyannouncements/downloads/OpenreachCharter.pdf> [accessed 23 March 2017].

“Service. Our number one priority will be giving great service to customers. We’ll set new standards for delivering on time and getting things right. We hold ourselves accountable to fix problems.”

“For Consumer and SME customers we will: Raise our service standards and reliability. We aim to do much better than the rising standards already set by Ofcom. We aim to achieve on-time installations of 95% by 2017, working with our communications provider customers. We will continue to invest in innovation and network maintenance to reduce our network fault rate.”

Figure 6.3: Openreach’s published performance for on-time installation



Source: reprinted from Openreach, *Better, broader, faster, Better service for homes and smaller businesses*, with permission from Openreach, part of the BT Group¹⁴³

- 6.30 Openreach therefore set itself a performance level target of 95% for copper and GEA-FTTC; this was above our 2014 assessment of an upper bound of 93% for WLR and MPF which we considered appropriate when setting quality standards in 2014.
- 6.31 Openreach publishes its quarterly year-to-date performance for on-time installations for copper and fibre (FTTC) on its website. Figure 6.3 above shows Openreach’s own reporting of its performance as at Q3 of the fiscal year 2016/17.

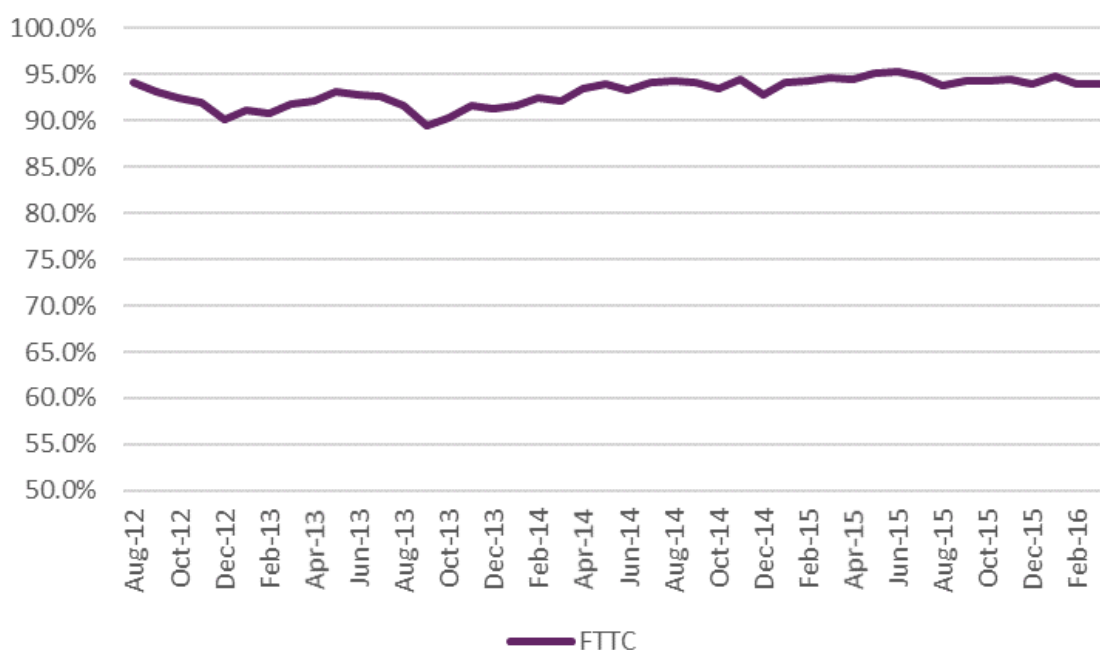
Openreach’s actual performance for installing GEA-FTTC on time

- 6.32 We do not currently require BT to achieve a specific standard in relation to on-time installation for GEA-FTTC. As shown in Figure 6.4 below, covering the period August 2012 to February 2016, Openreach’s actual performance in on-time GEA-FTTC

¹⁴³ See Openreach, 2017. *Better service for homes and smaller businesses*. <https://www.homeandwork.openreach.co.uk/dashboard/overview.aspx?bbf=bshsb-3> [accessed 10 March 2017].

installations provision has also remained between 90% and 95%, trending toward the latter since the summer of 2013.

Figure 6.4: UK GEA-FTTC orders provisioned on time, all orders (%)



Source: Ofcom analysis of BT data submitted in response to the third QoS information request to BT of 19 July 2016

Our reasoning and proposals for setting higher levels for quality standards for on-time installations

- 6.33 We set out in our 2014 FAMR Statement that the intention of our standards was to provide a backstop, not to define the appropriate service quality for Openreach to maintain. However, we identified the risk that Openreach could seek to perform at the regulated standard rather than seek continually to innovate on quality and deliver improved performance in collaboration with its customers.
- 6.34 In the case of Openreach's observed performance for on-time installations, we provisionally conclude that the available evidence suggests that, without further intervention by us, there is little to suggest that telecoms providers and their customers would experience any improvement in the performance provided by Openreach from that experienced over the last four years or so, save the as-yet-unachieved committed ambition in Openreach's Charter.
- 6.35 In Section 3 we set out the key considerations we will take into account when deciding on the levels of the standards to propose. We have therefore considered lower and upper bounds, as we did in the 2014 review, but this time in the context of our Strategic Review and our approach to regulating quality of service in this review. In particular, we consider that higher levels of certainty that Openreach will complete orders for the provision of wholesale network access products and services on the agreed delivery date are appropriate and necessary to sustain effective downstream competition and meet the rising demands of telecoms providers and their customers.

- 6.36 The importance to customers of installing products and service on time, and as promised, was highlighted in research conducted by Jigsaw in February 2016.¹⁴⁴ In its report on customer experiences of installations that require a visit to the premises by an engineer, respondents highlighted that time-keeping was “essential”, and that installations should be completed to the original schedule agreed.¹⁴⁵
- 6.37 Even in the case of self-installations (i.e. where providers post a modem/router to customers who then plug it in themselves), the Jigsaw research found that customers switching broadband provider or moving premises are sometimes disappointed to discover that, having installed their new router, they cannot use it immediately because their new service will not actually be switched on for several days.
- 6.38 Regarding an upper bound for orders installed on time, we note Openreach’s decision in 2015 to set 95% as its own 2017 target. This implies that achieving an average annual performance of 95% lies within Openreach’s current or anticipated operational capability on a sustainable basis. We would therefore expect any upper bound of performance to exceed 95%. The degree to which Openreach may exceed 95% now and in the future, is likely to depend on a wide range of factors including: demand for its range of wholesale network access products across the UK; the level, skilling, equipping, transportation and management of its resources; and the quality of Openreach’s network records. We discuss the reasons why some orders are not completed on time later in this section in our assessment of late installations.
- 6.39 Openreach’s actual annual performance is around 93% of orders installed on time for WLR and MPF on a sustained basis¹⁴⁶ and, since the summer of 2015, also for GEA-FTTC.¹⁴⁷ However, this is a measure of performance aggregated at a national level whereas annual performance at a regional level across services varies between 92% and 94%. Based on our analysis of annual performance by region we consider that the appropriate lower bound should be set at 92%, which is a level of on-time installation performance which Openreach has achieved irrespective of service and region (except for two regions for WLR in 2014/15).¹⁴⁸
- 6.40 While recognising that deriving bounds is an exercise of judgement guided by such evidence as is currently available to us and in the light of the observed performance since our last review, we consider that the appropriate lower and upper bounds we should provisionally have in mind in this review are 92% and greater than 95% but less than 100%.¹⁴⁹

Proposal to set an initial level of performance for on-time installations to 92%

- 6.41 In terms of proposing appropriate levels for *ex ante* quality standards for the forward-looking period in relation to on-time installations for WLR, MPF and GEA-FTTC, we consider that setting a safeguard level to incentivise Openreach to ensure there is no

¹⁴⁴ Jigsaw, 2016.

¹⁴⁵ Jigsaw, 2016.

¹⁴⁶ Both prior to and post the introduction of our standard of 90% in 2014.

¹⁴⁷ As shown in Figure 6.4.

¹⁴⁸ Openreach’s compliance report for 2014/15 of 30 April 2015 reports two instances where performance fell below 92%. Over the period July 2014 to March 2015 on-time installation performance for WLR was 91.5% and 91.9% in two UK regions. In Openreach’s compliance report for 2015/16 dated 28 April 2016, all regions exceeded 92% over the period for both WLR and MPF.

¹⁴⁹ This is because on any given day we recognise that Openreach will not complete a small proportion of jobs for various reasons such as jobs that end up requiring specialist access equipment and/or jobs where the deployed engineer is not skilled to resolve emergent issues found during the installation work.

material deterioration of its current performance is an appropriate place to start. But, whereas Openreach has previously maintained an annual national performance of around 93% of installation completion to the agreed delivery date under the existing standards, we propose setting an initial level of quality standard at 92% to allow for regional variations. Increasing the regulated level of performance requirement from 90% to 92% is closer to Openreach's actual current and historical level of performance including at a regional level.

- 6.42 We do not consider that increasing the regulated standard from 90% currently to 92% will, of itself, have any material impact on Openreach's resources since this is a level of performance which Openreach has consistently delivered and exceeded. We consider the impacts of our quality of service proposals on resources in the context of our wider work further in Section 8 and Annex 7.
- 6.43 We consider this initial level to be appropriate and proportionate for the following reasons:
- it provides more certainty that Openreach will, at the very least, continue to perform at its current level, particularly in the light of our proposals to set higher quality of service standards in this review; and
 - it is operationally achievable since the proposed level of 92% is below the actual level performance which Openreach has maintained across each of its regions.

Proposal to set the level performance for on-time installations at the end of this review period to 95%

- 6.44 While an initial proposed level of 92% would serve to meet our aim of ensuring Openreach's performance does not deteriorate, it would not address to any significant degree our strategic intent of creating incentives to ensure Openreach is responsive to the increasing demands of telecoms providers and customers for better service in downstream competitive markets going forward. So, while we consider a safeguard level of 92% for on-time installations is appropriate and proportionate for the period 2018 to early 2020, as Openreach adjusts its operations to meet other proposed quality standards (particularly in respect of repairs), we propose that the quality standard for WLR, MPF and GEA-FTTC for on-time installations in the final year of this review period should be set at the level of 95%. This level lies within our estimate of the upper bound set out above and is in line with a level of performance which Openreach has already set for itself. Moreover, we consider our approach provides Openreach with a reasonable period in which to ensure it prepares its operations to maintain on-time installations above 95% while meeting our proposed standards for repairs.
- 6.45 We do not consider that increasing the regulated level for installations completed on time to 95% over 2020/21 will have a significant impact on Openreach resources in providing this level of performance. Openreach has already committed to reaching this level of performance in 2017 although we assume this target is national rather than regional in application. We would therefore expect some impact on resources where Openreach is required to exceed 95% for on-time installations in each of the regions over 2020/21. We consider the impacts of our quality of service proposals on resources in the context of our wider work further in Section 8 and Annex 7 in which we take account of regional compliance.
- 6.46 Our proposals are summarised in Table 6.5 below which, when taken together, seek to provide Openreach with incentives to improve its aggregate annual performance in

each region in completing WLR, MPF and GEA-FTTC installations on the date agreed with its customers from around 93% today to above 95% by 2020/21.

6.47 We consider that our proposals around quality of service levels and timing strike a reasonable balance between:

- a) seeking to promote better performance in line with our judgement as to what is reasonably achievable based on the available evidence; and
- b) providing Openreach with a reasonable period to make such changes to its operations as are necessary to meet this level of service improvement as well as our broader proposals for quality of service remedies.

6.48 Based on WLR, MPF and GEA-FTTC volumes in 2015/16, we estimate that, over the review period, our proposals will ensure that over 400,000 more UK customers will be afforded greater certainty that the provision of fixed voice and broadband services to their homes and small businesses will be installed on the date they were promised.

Table 6.5: Proposed annual quality standards for on-time installations (WLR, MPF and GEA-FTTC) for the forward-looking period

	Current standard	Proposed new standards		
		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
% of installations to be completed by customer contracted date (Adjusted standard for <i>force majeure</i>)	90% (89%)	92% (91%)	92% (91%)	95% (94%)

Question 6.1: Do you agree with our proposals for on-time installation standards? Please provide reasons and evidence in support of your views.

Quality standards for installation appointments

How and why we set QoS standard levels of 55% rising to 80% on BT in relation to the proportion of appointed orders offered an appointment within 12 working days in 2014

6.49 In our 2014 FAMR Statement we set our decision to impose QoS standards on Openreach's performance in making appointments available to its wholesale customers against the existing SLA of 12 working days. These standards were set at 55%, 68% and 80% respectively for each of the three years from 2014/15 to 2016/17.¹⁵⁰ The proportion of appointed orders offered an appointment within 12 working days by Openreach was just 42% in 2012/13.

6.50 There was, at the time, some debate over the choice of the appointment SLA of 12 working days. Some telecoms providers thought this should be reduced to better meet consumers' expectations, and there was consumer evidence at that time of demand for shorter lead times. On the other hand, some telecoms providers were

¹⁵⁰ The standards were set at 54%, 67% and 79% to provide Openreach an allowance of 1% for *force majeure*.

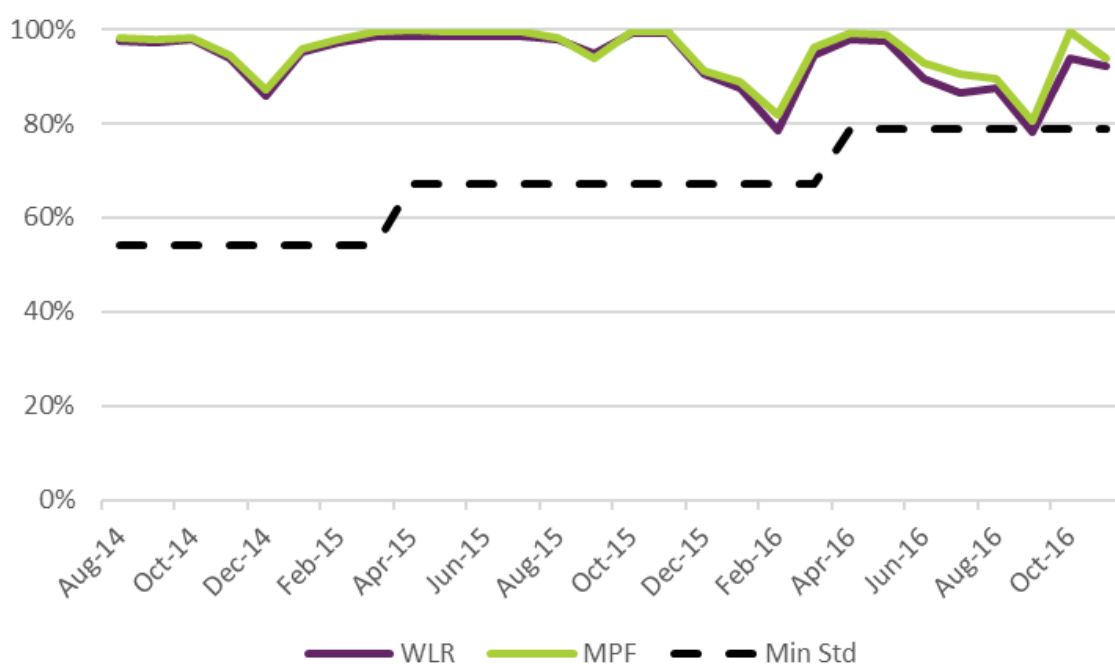
concerned about cost impacts and that other aspects of performance were of a higher priority. At that time, we decided in the absence of clear evidence, industry consensus and for practical reasons,¹⁵¹ not to impose a different standard.

- 6.51 Regarding how we set the levels for the standards for appointments, we again considered reasonable bounds. We selected, following consultation, Openreach's better historical performance of 65% over 2011/12 as an appropriate lower bound for the range of the standards in respect of provision appointment availability.
- 6.52 Provision appointment availability SLAs were not introduced until November 2012, so, when we made our decisions in 2014, there was less historical data against which to assess the upper level of performance that could be consistently achieved. However, we considered at that time that installation appointment availability was primarily a function of the level of resources made available for appointments and should not therefore have an upper operational limit or glass ceiling to performance. We therefore considered it appropriate to view the upper bound to be 100%.
- 6.53 We used our judgement to set a standard of 80% for provision appointment availability because, at the time, we considered it struck an appropriate balance in imposing a reasonably high level of performance against the 12 working day SLA and would have a relatively small impact on connection and rental costs in absolute terms based on our cost impact assessments. The lower standards, 55% and 68% for the first and second years (2014/15 and 2015/16), were derived from our assessment of necessary transitional arrangements, given that Openreach was performing very poorly at that time. We took the view that these provided a reasonable balance between the need to improve performance and the need to give Openreach time to make the necessary changes to achieve them.

Openreach's actual performance against the 2014 QoS standards of 55% rising to 80% for WLR and MPF appointment availability

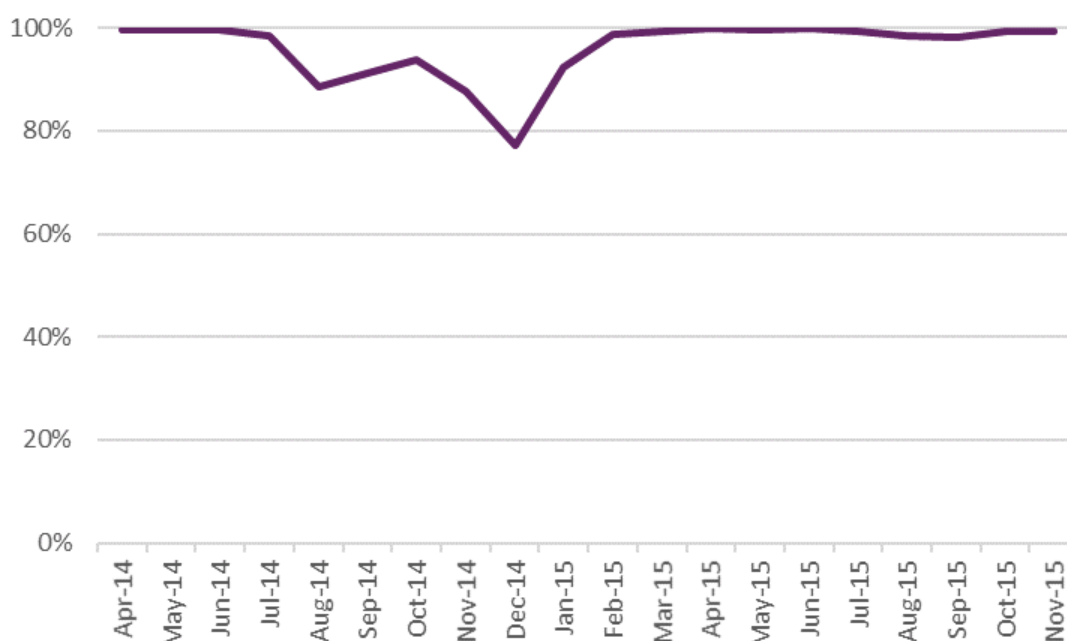
- 6.54 We have set out our own provisional assessment of Openreach's observed performance in relation to appointment availability in Annex 6 for the period 2014 to 2016.
- 6.55 BT's annual compliance reports show that, in the first two years of the 2014 market review period (2014/15 and 2015/16), Openreach exceeded the appointment availability standards imposed for both WLR and MPF in every UK region. Our KPIs, shown in Figure 6.6 below, indicate that over the reporting period Openreach exceeded the annual standard at the UK level in all months for MPF and in all but one month for WLR.

¹⁵¹ These related to the complexities and uncertainties surrounding the analysis of resource/cost implications.

Figure 6.6: UK 12 day appointment availability for WLR and MPF services (%)

Source: Openreach mandatory non-discrimination KPIs.

6.56 We do not currently require BT to comply with a standard in relation to the availability of appointments for GEA-FTTC. The industry-negotiated SLA for GEA-FTTC appointments is also 12 working days. Data we have gathered under our statutory information gathering powers shows that GEA-FTTC performance against SLA has often been above 99%, except for in the second half of 2014 as shown in Figure 6.7 below.

Figure 6.7: UK 12 day appointment availability for GEA-FTTC services (%)

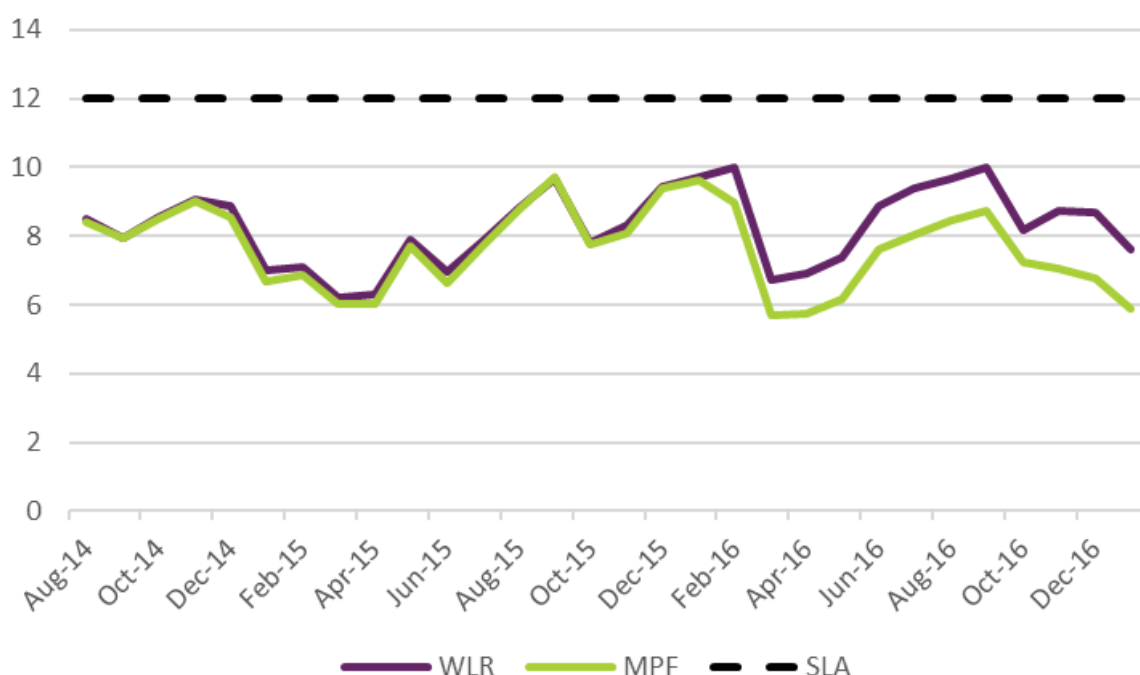
Source: Ofcom analysis of BT data submitted in response to the first QoS information request to BT of 4 January 2016.

Openreach's actual performance on lead times for the first available appointment

- 6.57 As mentioned above, we set our 2014 standard for appointment availability against a SLA for WLR and MPF at within 12 working days for the first available appointment on orders requiring an engineer visit. A similar SLA of within 12 working days has been agreed between Openreach and telecoms providers for GEA-FTTC.
- 6.58 Openreach reports its average first available appointment as eight working days for copper and FTTC over the period April to December 2016.¹⁵² Openreach also publishes its quarterly first available appointment performance broken down by its main copper services and for each of its regions.¹⁵³
- 6.59 We monitor Openreach's actual weekly and monthly performance in its lead times for the first available appointment among many other areas of service performance. We do this through monthly Openreach, Ofcom and OTA2 service meetings in which we review Openreach data on its average weekly appointment availability performance, broken down by each region, and through the review of monthly KPIs which we require Openreach to supply.
- 6.60 Figure 6.8 below plots the monthly average first available appointment from August 2014 to December 2016. Among other things, we note the variation which can be observed between average availability performance highs and lows and when these occur.

¹⁵² Openreach, 2017. *Better, broader, faster. Homes and smaller businesses*. <https://www.homeandwork.openreach.co.uk/dashboard/overview.aspx?bbf=bshsb-1> [accessed 13 March 2017].

¹⁵³ Openreach, 2017. *Our performance. Homes and smaller businesses*. https://www.homeandwork.openreach.co.uk/kpi-pages/KPI_overview.aspx?kpi=3 [accessed 13 March 2017].

Figure 6.8: UK appointment availability for WLR and MPF (working days)

Source: Openreach mandatory non-discrimination KPIs

- 6.61 As explained further in Annex 6, we believe that these variations reflect Openreach's practice of extending the lead time of installation appointments in periods when it is under resource pressure, particularly in the context of high levels of repair volumes (e.g. due to adverse weather events). During such periods, Openreach is therefore able to divert resource for short periods of time to deal with issues such as damage to its network resulting from extreme weather events.
- 6.62 We consider that it is reasonable and appropriate to continue to allow Openreach some flexibility in organising its resources to trade off spikes in demand for repair against demand for timely installation appointments. This is consistent with our approach in Section 3, particularly our consideration of costs to customers and telecoms providers. In designing our proposals for quality standards, we consider all these factors (i.e. not just the selection and levels for quality standards but the degree of aggregation we apply in their application, such as by geography, by wholesale services, by time, etc.).

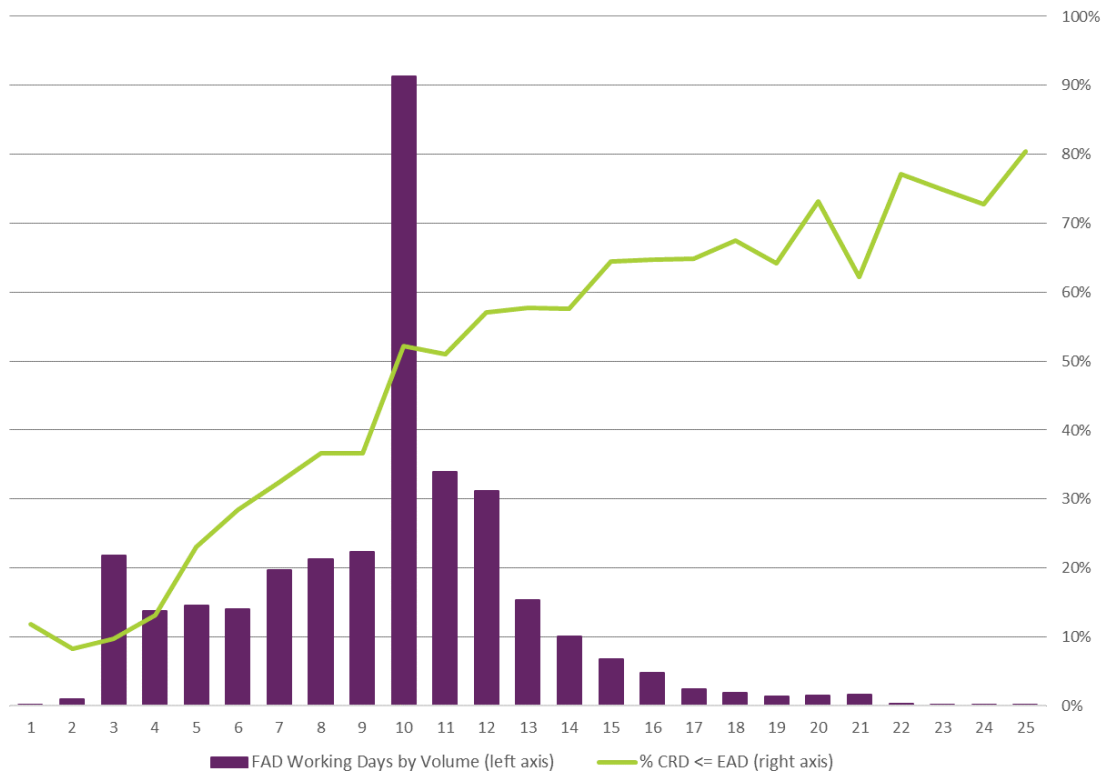
Take up of Openreach's first available appointments

- 6.63 We have considered evidence supplied to us by Openreach about the actual take up of the first available appointments it made available for individual orders for each of WLR, MPF and GEA-FTTC between 25 June and 11 November 2016. This data is reproduced in Figures 6.9 to 6.11 below where the bars show the volume of first available appointments by working day offered by Openreach and the lines show the proportion of first available appointments taken by telecoms providers by working day. So, for example, in Figure 6.9 below, Openreach offered over 100 first available appointments on the tenth working day after those orders for WLR were placed by telecoms providers. Telecoms providers took the first available appointment offered by Openreach for just over half of those orders.

- 6.64 We currently require Openreach to provide a first available appointment on orders for WLR and MPF within 12 working days. The evidence we have obtained in relation to telecoms providers' take up of first available appointments indicates that they actually select appointment dates longer than 12 working days for up to 40% of their appointed WLR orders, 35% for MPF and about 15% for GEA-FTTC.

Figure 6.9: Take up of the first available appointment for WLR

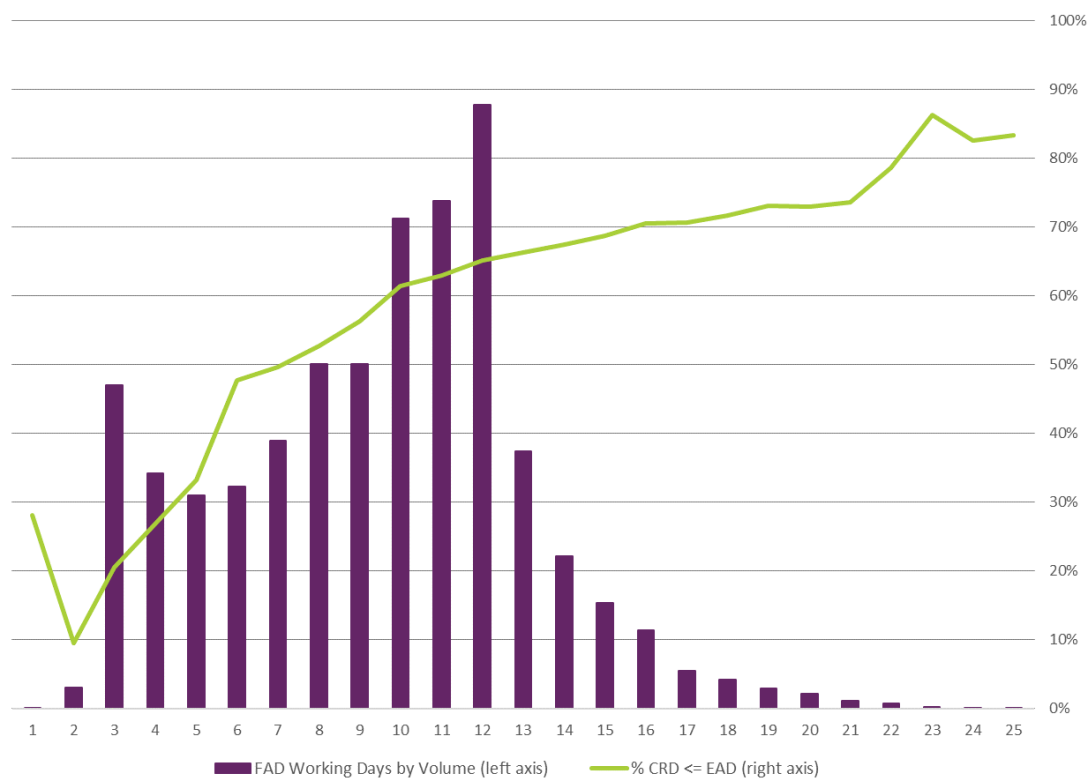
[3<]



Source: BT Openreach data provided to Ofcom dated 6 March 2017.

Figure 6.10: Take up of the first available date for MPF

[3<]

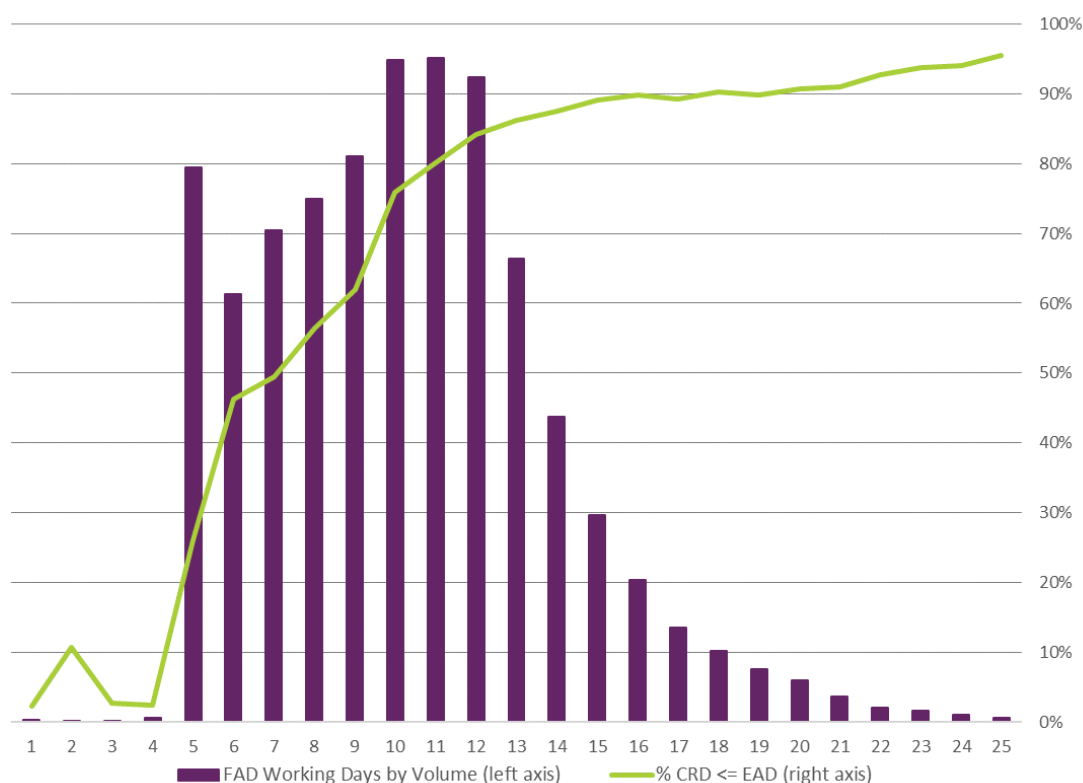


Source: BT Openreach data provided to Ofcom dated 6 March 2017.

Figure 6.11: Take up of first available appointment for GEA-FTTC¹⁵⁴

[3<]

¹⁵⁴ Appointments comprise both those for engineering work at the street cabinet only and those where the installation also includes a visit to the customers' home or business premises.



Source: BT Openreach data provided to Ofcom dated 6 March 2017

Our reasoning and proposals for setting higher levels of quality standards for timely appointment availability

- 6.65 Openreach's actual performance since we imposed standards on appointment availability in 2014 shows that, over 2014/15 and 2015/16, it had been making initial appointments available within 12 working days for over 95%¹⁵⁵ of WLR and MPF orders requiring an engineer visit.¹⁵⁶ This significantly exceeds the standards we imposed in our last review and which are currently set at 80%.
- 6.66 Openreach's performance in respect of making appointments available for GEA-FTTC installations, which to date has not been subject to standards, has been at a similarly high level. Although a small and decreasing number of GEA-FTTC installations¹⁵⁷ involve an Openreach engineer visiting the customer's home or business (where the telecoms provider has ordered this), the vast majority of appointments made by telecoms providers concern the scheduling of an Openreach engineer connecting their customers' superfast broadband service at the street cabinet.

¹⁵⁵ Openreach, 2015. *Openreach Minimum Standards compliance report for 2014/15. Issue 1.0*; Openreach, 2016. *Fixed Access Market Review Minimum Standards compliance report for 2015/16. Issue 1.0*; and Openreach, 2017. *Openreach, Ofcom and OTA2 service meeting, 23 February 2017. Slide-deck. Slide 11, FAD including 2016/17 year to date.*

¹⁵⁶ 'Over 95%' when assessing Openreach's annual performance across the UK and by combining the results for WLR and MPF for each of 2014/15 and 2015/16. Openreach's 2016/17 year-to-date performance suggests that performance may be less than the two previous years.

¹⁵⁷ Openreach, 2017. *Openreach, Ofcom and OTA2 service meeting, 23 February 2017. Slide-deck. Slide 7, NGA completions by volume for engineering visits and self-installs over the period 11 July 2014 to 10 February 2017.*

- 6.67 We begin our assessment of setting an appropriate level for quality standards for appointment availability by again looking at reasonable bounds in the context of our regulatory approach set out in Section 3.
- 6.68 We make no change to our conclusion in our 2014 review that appointment availability is mainly a function of the level of resources made available for appointments and not subject to operational limits. Therefore, we continue to consider an upper bound of performance to be 100%.
- 6.69 Further, our analysis of Openreach's observed performance in appointment availability since our last review demonstrates that it clearly has had the capacity within its resources to achieve a high level of sustained performance. Openreach has been making initial appointments available within 12 working days for comfortably more than 90% of orders for WLR, MPF and GEA-FTTC lines which require an appointment (when viewed across all its regions combined). We consider therefore that an appropriate lower bound of performance should be significantly higher than the 65% we selected in 2014 based on Openreach's much poorer level of performance seen over the period 2011/12.
- 6.70 We propose that an appropriate lower bound should be set at 90%¹⁵⁸ which we base on Openreach's actual performance over the year 2015/16 accounting for the lowest observed annual performance at a regional level across WLR and MPF.

Proposal to set the level for appointment availability to 90% over the review period

- 6.71 Selecting a level of performance for the forward-looking period between the bounds of 90% and 100% is, in our view, largely a matter of exercising our regulatory judgement to balance some or all of the factors we have set out in Section 3 above, such as impacts on customers, telecoms providers and competition, Openreach's operational capabilities and costs.
- 6.72 Setting a level of performance based on our revised assessment of an appropriate lower bound of 90% would represent a significant increase in the level of certainty delivered through regulation, as compared to the 80% currently in place under our standards. While raising the level to 90% would remain below Openreach's current levels of performance in offering timely appointments for orders requiring an engineer visit of around 95%, it would remove *ex ante* any prospect of material deterioration in Openreach's current performance. Consistent with our approach set out in Section 3, we consider setting the level at 90% would provide much improved certainty for telecoms providers and customers going forward by applying a reasonable safeguard to ensure that the current level of service performance on available timely appointments is maintained over the period of this review.
- 6.73 We have carefully considered whether it would be appropriate to set a level above this lower bound and have provisionally concluded that it would not when viewed in the context of our wider work, i.e. together with our proposals for quality standards on Openreach's repair performance and our proposal that Openreach offer a first available appointment within ten working days by 2020 which we discuss below. In this context, we consider that we should be cautious in setting a level above 90% for available timely appointments, particularly where there are, in our view, significant uncertainties in determining what level best balances the impacts on customers, telecoms providers and competition, as well as Openreach's operational capabilities and costs. For example, when considering our policy proposals in the context of our

¹⁵⁸ We discuss *force majeure* allowances later in this section.

wider work, we recognise that the higher we set the proportion of relevant orders for which an available timely appointment must be offered, the less scope Openreach has available to flex its resources especially during peak demands for repair. Failing to make some allowance for Openreach to optimise efficient use of its resources across repairs and installations could lead to higher costs than is necessary to achieve our policy objectives for service quality improvements. We further consider that Openreach's service performance at a regional level is above 90%, but there are some significant regional variations. For example, Openreach's performance in making available timely appointments for WLR orders over 2015/16 varied between around 89% to 99%.¹⁵⁹

- 6.74 We do not consider that increasing the regulated level from 80% to 90% for timely appointment availability will have any material impact on Openreach's resources in providing this level of performance for timely appointment availability. Openreach has been and continues to exceed this level of performance within existing resources. However, we consider the impacts of our quality of service proposals on resources in the context of our wider work further in Section 8 and Annex 7.
- 6.75 We therefore propose that the appropriate level should be set and maintained at 90% over the review period. We consider this level to be appropriate and proportionate because:
- it provides a much higher degree of certainty than at present that Openreach will continue to perform close to its current level of performance, particularly in the light of our proposals to set higher quality of service standards in this review;
 - it is achievable based on Openreach's current and sustained performance since 2014; and
 - it is least likely to give rise to unintended consequences in the context of the proposals we are making as part of our wider work.

Proposal to shorten the lead time for a first available appointment to ten working days by 2020

- 6.76 The rationale for requiring shorter lead times for appointments is to reduce the time to complete the third of installations which require an Openreach engineer visit. We recognise that, while shortening the first available appointment timeframe may not have a significant impact on the average time to install all orders for WLR, MPF and GEA-FTTC, it would enable telecoms providers to provide their customers with earlier Openreach appointments which are more aligned with customers' rising expectations for fast delivery and better service. We have set out above why we consider that Openreach's service performance in making timely appointments available for appointed orders is a key factor in the time to install these types of orders and is therefore important for competition in these markets.
- 6.77 We have set out Openreach data on the take up of first available appointments above. This shows, for example, where Openreach offers WLR, MPF or GEA-FTTC installation appointments within six days of an order being placed, fewer than 50% of these appointments are accepted.¹⁶⁰ As discussed above, we do not have evidence that enables us to determine whether this is mainly because earlier appointments are

¹⁵⁹ Openreach, 2017. *Openreach, Ofcom and OTA2 service meeting, 23 February 2017*. Slide-deck. Slide 11. FAD including 2015/16 year to date.

¹⁶⁰ See Figures 6.9 to 6.11 above.

rejected by telecoms providers because they are not ready (e.g. their arrangements for the dispatch of home equipment takes longer than six days), because these earlier appointments are rejected by customers themselves, or due to a combination of both (or possibly some other reason). Nevertheless, this evidence suggests that the benefits of imposing very short timescales for installation appointments may be limited at present, although changes in customer demand and retail practices may lead to telecoms providers seeking shorter lead times from Openreach in future.

- 6.78 We have therefore given careful to consideration as to whether we should require that the lead time for a first available appointment should be shortened for the purposes of our regulations relating to timely appointment availability. On balance, we consider that there is some scope to reduce lead times for appointments over the course of this review.
- 6.79 We propose that the lead time is reduced to within ten working days but not until 2020 and have modelled this in our analysis of the impacts on Openreach's resources in Annex 7 which we summarise in Section 8 in terms of our overall package of QoS remedy proposals. We consider that ten working days strikes a reasonable balance between expectations of faster installations¹⁶¹ and likely take up of earlier appointments and aligns appointment availability with our ten day customer protection lead time for customers transferring their service from one telecoms provider to another when switching. We do not consider that imposing SMP regulations to require Openreach to provide a sub-ten day first available appointment is appropriate at present. This is primarily because of the uncertainty that imposing shorter lead times would necessarily yield competition benefits if take up was limited. Based on the evidence of take up supplied by Openreach in Figures 6.9 to 6.11 above, and assuming that take up remains the same going forward as recorded in 2016, reducing the first available appointment lead time from 12 to ten working days results in a relatively small fall in the proportion of take up (less than 10%). But, because Openreach would be offering first available appointments earlier than shown in Figures 6.9 to 6.11, we would expect the take up by volume to increase.
- 6.80 In proposing that the lead time for the first available appointment is reduced to within ten working days, we specifically mean our regulated quality standards. We make no proposal about Openreach's SLA for appointment availability in its contracts with telecoms providers for WLR, MPF and GEA-FTTC. Industry may or may not wish to engage in further negotiations on such SLAs. We have set out in Section 8 our expectations about the conduct of such negotiations between access seeking telecoms providers and an incumbent access provider.
- 6.81 Combined with our proposal that 90% of orders should be offered a timely installation appointment, our proposals would see more customers being offered earlier first installation appointments by 2020. We have provisionally concluded that the first available appointment should not be reduced to within ten working days until then because it provides for:
- a reasonable period over which other proposed policies intended to improve quality of service across industry are expected to come into effect, including automatic compensation for customers suffering poor service at the retail level and transparency of retail providers' comparable service performance;

¹⁶¹ Discussed in Section 3.

- a period in which telecoms providers might adjust their installation processes to seek to deliver services to their customers more quickly; and
- a period in which Openreach can monitor and adjust its operations to meet changing regulatory requirements and the demands of its customers.

6.82 Our proposals for both the level of certainty of first appointment availability and the lead times for the first available appointment are summarised in Table 6.12 below. Our proposals, when taken in the context of our wider work, seek to provide Openreach with incentives to maintain its aggregate annual performance in offering timely appointments for WLR, MPF and GEA-FTTC orders which require an engineer visit to over 90% in each region and reduce its lead time for a first available appointment from within 12 workings days to within ten working days by 2020.

6.83 We consider that our proposals around quality of service levels and timing strike a reasonable balance between seeking to promote better performance in line with our judgement (as to what is reasonably achievable based on the available evidence) and providing Openreach with a reasonable period to make such changes to its operations (as are necessary to meet this level of service improvement and our broader proposals for quality of service remedies).

Table 6.12: Proposed annual quality standards for timely appointment availability (WLR, MPF and GEA-FTTC¹⁶²) for the forward-looking period

	Current standard	Proposed new standards		
		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Number of working days offered for installation appointments	12	12	12	10
Frequency with which regulated installation appointment date must be offered (Adjusted standard for <i>force majeure</i>)		First year (2018/19)	Second year (2019/20)	Third year (2020/21)
		80% (79%)	90% (89%)	90% (89%)

Question 6.2: Do you agree with our proposals for new timely appointment availability standards? Please provide reasons and evidence in support of your views.

¹⁶² For the avoidance of doubt appointments for an engineer visit includes GEA-FTTC installations at the street cabinet only and/or appointments for an engineer visit to the customer's premises.

Other considerations relating to the design of our proposed QoS standards

Proposals to maintain the application of our quality standards for installations on an annual basis in ten UK regions and maintain current allowances for *force majeure* and MBORC¹⁶³

- 6.84 In the light of our experience since first imposing QoS standards on Openreach in 2014, we do not see any reason to make changes to our 2014 policy decisions to apply these standards over an annual period, with regional application and to retain provisions regarding MBORC allowances. We have assessed each of these elements in more detail in Section 5 about repairs. We consider that this assessment applies, in large part, to installations too.
- 6.85 We therefore propose to continue to allow a fixed 1% allowance for local MBORC events, as well as to maintain an allowance for time-limited High Level MBORC events in two regions per year. Maintaining these provisions will continue to ensure that quality of service standards have effect regardless of where customers live and work in the UK while providing Openreach with operational flexibility to deploy its field force as is necessary to restore the network when impacted by matters outside its control, such as severe weather events (e.g. floods and storms).

Proposal to apply our annual quality standards for installation date certainty to the aggregate of orders for WLR, MPF and GEA-FTTC

- 6.86 In 2014, we set separate quality of service requirements on BT with respect to each of the regulated services. In this review, we no longer propose to impose these quality standards separately to each of WLR, MPF and GEA-FTTC. While doing so would continue to satisfy our objectives to incentivise improvements for on-time installations across each of these services (so we maintain this as an option), we recognise that the addition of GEA-FTTC would increase the regulatory burden by adding a further layer of complexity to our quality of service regulation and compliance monitoring. We therefore propose to apply the above annual quality standards regionally to orders for WLR, MPF and GEA-FTTC combined.
- 6.87 Whereas combining regulated products in this way, could give rise to concerns that BT could use quality of service to engage in some form of non-price discriminatory conduct across markets based on the consumption of these products between BT downstream divisions and other telecoms providers, we do not consider that this is likely in practice for two main reasons.
- 6.88 Firstly, we consider it likely to be both difficult and costly for Openreach to configure its operational organisation to enable it to vary its processes for different services.
- 6.89 Secondly, the mix of new WLR, MPF and GEA-FTTC installations between each of the ten UK regions varies materially, and we consider that this is likely to persist over the forward-looking period. Notwithstanding other uncertainties around future demand for Openreach's suite of wholesale network access products, we consider that any incentive to game service performance on installations by Openreach on a

¹⁶³ MBORC is a term meaning Matters Beyond Our [BT's] Reasonable Control.

product basis is remote and would, in any event, likely be offset by regional compliance risks.¹⁶⁴

- 6.90 Moreover, we propose to maintain transparency obligations on BT *inter alia* by service and by telecoms providers, such that any such discrimination in the quality of service provided in respect of one service compared to another and/or between different telecoms provider would be detectable. We would therefore be able to consider further intervention were we to be concerned that differentials in service performance by service raised competition concerns.

Question 6.3: Do you agree with our proposals regarding compliance? Please provide reasons and evidence in support of your views.

Late installations

Assessment of late installations

- 6.91 We have reviewed what happens to orders which are not installed on time by Openreach; around 5% to 7% of total orders. This still affects a considerable number of customers given the volume of WLR, MPF and GEA-FTTC installation orders being placed by telecoms providers with Openreach to meet the mass market demand for fixed line voice and/or broadband services.
- 6.92 When we examine how long it takes to complete these late installations (i.e. how long is the delay between when the order should have been completed and when it was finally installed), what we find is that most customers who experience a delay have their order installed soon after the agreed date and that there are progressively fewer and fewer customers who experience longer and longer delays. One of the main causes of the length of the delay is down to the difficulty Openreach experiences in resolving the problem which has caused the delay.
- 6.93 About half of the 5% to 7% of orders which are not completed on time, are late because either there is no network at the home or premises to be connected (either the property is not connected to Openreach's network or there is no spare capacity in the existing network) or there is a problem in the cable routing for the connection. Where this is the case, the length of the delay varies very significantly from a few days to months. The length of the delay typically reflects the complexity of the network construction activity required to connect the home or business. In some cases, Openreach's engineering works can be subject to lengthy delays which are not in its direct control, such as getting permissions from land owners to lay ducts/cables and erect poles and obtaining approvals from local authorities to close roads to carry out works.
- 6.94 The other half of the 5% to 7% of orders which are not completed on time, do so either because Openreach or the customer has missed the installation appointment or because the engineer dealing with the installation finds a fault or problem with the connection which he or she is not able to resolve.¹⁶⁵ This might, for example, be due to the engineer not having the appropriate skillset to resolve a problem on site or because the engineer lacks specialist tools required to complete a given task. The

¹⁶⁴ We also note that the commitment provided by BT in respect of making Openreach more independent would impose a duty on the Directors of Openreach to treat all downstream telecoms providers equally and fairly.

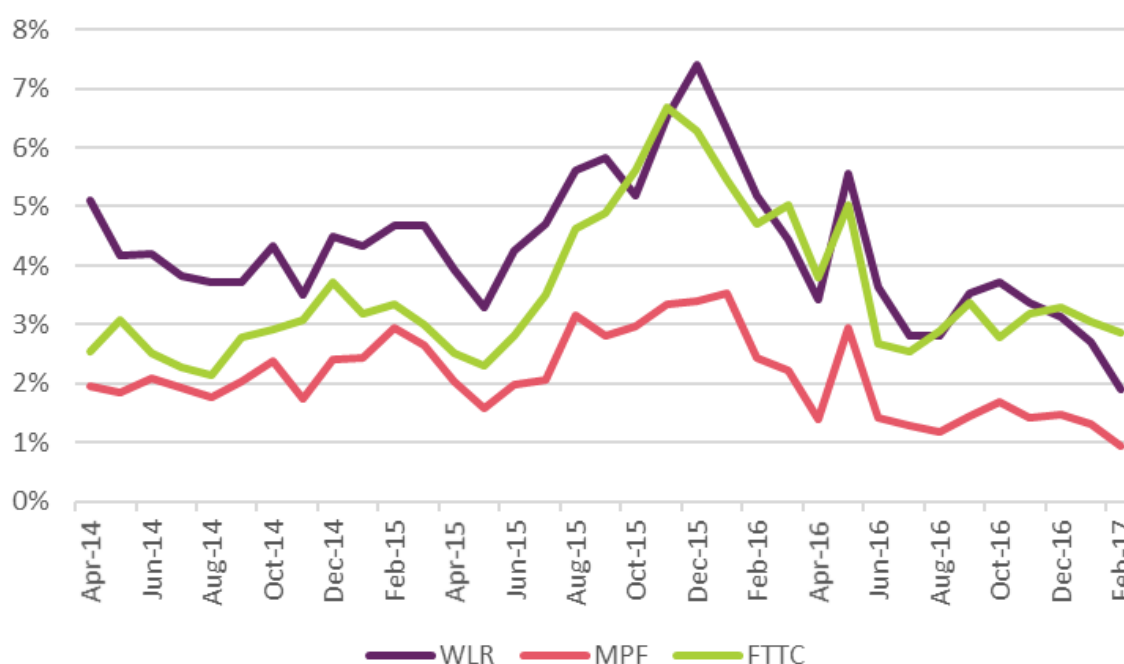
¹⁶⁵ These two reasons are broadly equally split.

length of such delays is usually between 1 to 5 working days. Delays from missed appointments are typically between 1 to 14 working days, mainly dependent on when the customer is next available. There are also a small number of instances where an order fails on the day due to a system or administrative process issue and may be delayed by a day or two.¹⁶⁶

Missed installation appointments

- 6.95 As discussed above, missed appointments is one factor (but not the main reason) why installations are not completed on the agreed date. While the cause of Openreach missing appointments¹⁶⁷ may not always be wholly within its control (e.g. an engineer's van breaks down while driving to site), missed appointments can cause telecoms providers and their customers considerable frustration, inconvenience and potentially costs.
- 6.96 We have set out in paragraphs A6.33 to A6.35 in Annex 6 our review of the incidence of missed installation appointments by Openreach. In summary, the incidence of Openreach missing appointments increased from the summer of 2015, particularly in relation to WLR and GEA-FTTC and to a lesser degree MPF, but has been recovered by Openreach over the course of 2016 as shown in Figure 6.13 below.

Figure 6.13: UK WLR, MPF and GEA-FTTC provision appointments missed by Openreach (%)



Source: Ofcom analysis of BT data submitted in response to the first QoS information request to BT of 4 January 2016 and updated BT data submitted to Ofcom on 21 March 2017.

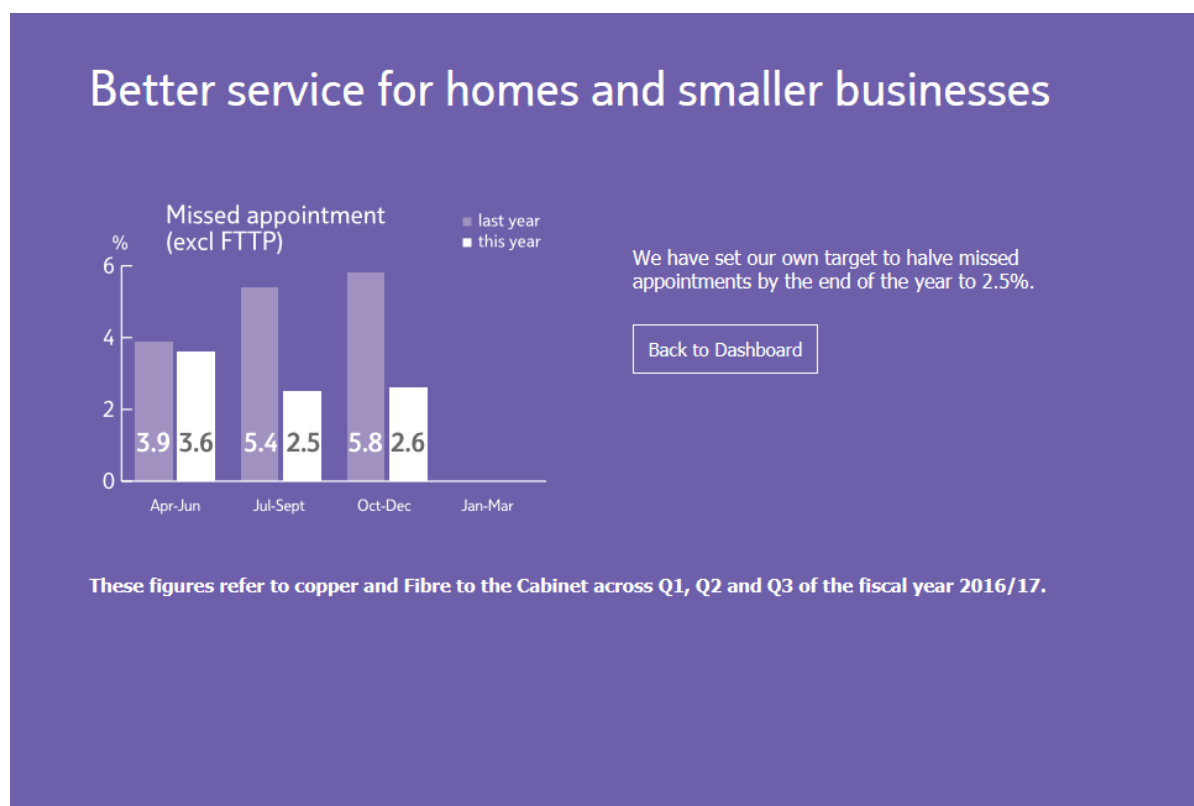
- 6.97 Openreach has publicly committed to targeting a 50% reduction in missed appointments (both appointments to visit customers' premises to carry out

¹⁶⁶ Openreach, 2016. *Ofcom Tails Review*, 1 December 2016. Slide-deck.

¹⁶⁷ This is as opposed to, for instance, customers missing appointments.

installations and repairs) by the end of the financial year 2016/17 and appears to be on track with its target as shown in Figure 6.14 below.

Figure 6.14: Openreach's performance on missed appointments for copper and GEA-FTTC



Source: reprinted from Openreach, *Better, broader, faster, Better service for homes and smaller businesses*, with permission from Openreach, part of the BT Group¹⁶⁸

- 6.98 However, while we recognise Openreach's subsequent performance commitments and the progress it has made during 2016 to reduce the proportion of missed appointments, we cannot be confident that current managerial commitment and focus on missed appointments will persist over the course of this review period.
- 6.99 We note our proposals in the 2016 NMR Consultation¹⁶⁹ and March 2017 WLA Consultation¹⁷⁰ to re-impose regulation that requires Openreach's relevant contracts to include a SLA for attending appointments and for compensation to be paid to telecoms providers where the agreed service level is not met. While we believe that such requirements should provide incentives to meet agreed levels of service, we recognise that the incentive effects may be limited. For example, the amount of compensation payable by Openreach to telecoms providers for missed appointments was increased from early 2015, yet Openreach's performance in attending appointments still deteriorated later that same year.

¹⁶⁸ See <https://www.homeandwork.openreach.co.uk/dashboard/overview.aspx?bbf=bshsb-2> [accessed 13 March 2017].

¹⁶⁹ Ofcom, 2016. Narrowband Market Review Consultation.

¹⁷⁰ Ofcom, 2017. Wholesale Local Access Consultation.

Proposals to minimise installation delays and improve the customer experience

Raising regulatory standards for on-time installations

- 6.100 We are proposing to require that Openreach completes more installation orders on time as set out above. We believe that this will increase Openreach's incentives to reduce missed appointments as well as other reasons that lead to the failure of completing installations on time as discussed above. Our proposal would see a reduction in the proportion of customers who experience any delay in having their fixed line voice and/or broadband service installed.
- 6.101 Nevertheless, we remain concerned about those installations that are not completed on time and want to ensure that Openreach has appropriate incentives to minimise delays in completing these orders. We have therefore considered other options intended to ensure that Openreach completes the installation of delayed orders as soon as reasonably practicable and focuses on improving customer experience, especially where they have no fixed and/or broadband service pending the completion of their installation.

Service level guarantees (SLGs)

- 6.102 Aside from regulatory quality standards, we ensure that Openreach also faces financial incentives both to avoid delays (in offering timely installation appointments and late installations) and to minimise any such delays which may arise.
- 6.103 These incentives are contained in the SLA and SLG provisions of Openreach's wholesale contracts with telecoms providers for providing network access services including WLR, MPF and GEA-FTTC services.¹⁷¹
- 6.104 Openreach is required by our SMP regulation to provide SLAs and SLGs in its contracts for certain regulated wholesale network access services including specific service level commitments to which SLGs apply relating to installations such as the:
- availability of an appointment for the provision of the service; and
 - completion of the provision or transfer of the service.¹⁷²
- 6.105 Under these contractual SLAs, BT agrees to pay telecoms providers a set amount for each day¹⁷³ of delay in respect of its orders beyond the SLA as set out in the terms of its contracts but limited to a specified maximum number of days. For example, under BT's contract for the supply of MPF, BT agrees to pay telecoms providers fixed compensation if the actual date of provision of any MPF order is later than the agreed delivery date. This is calculated at £8 per working day or part working day for a maximum of 60 consecutive working days from the working day after the agreed delivery date to the actual date the MPF order was installed.
- 6.106 As set out in Section 3, we consider that the justification for retaining contractual caps on compensation for the completion of installations is weak, even where these

¹⁷¹ Openreach. Products. Contracts.

<https://www.openreach.co.uk/orpg/home/products/contracts/contracts.do> [accessed 14 March 2017].

¹⁷² See Section 8 and proposals to impose Reference Offer obligations on BT in our 2016 NMR Consultation and March 2017 WLA Consultation.

¹⁷³ Day or working day depending on the contract.

caps are set to only capture the most extreme cases. The fact that compensation ceases once the cap is reached seems to us unlikely to reflect telecom providers' losses accurately, which might be expected to continue increasing until the installation order is completed. The incentive properties on Openreach to install services thereafter diminish leaving a proportionally small but potentially still significant number of customers vulnerable to very long delays.

- 6.107 Using information gathered under formal powers about completed installation orders over the period 2015/16, we assess that only [3<] % of installation orders are completed after the SLG cap of 60 payable days has been exceeded. However, even this small proportion still accounts for [3<] orders. As set out above in our assessment of late installations, these are typically orders which involve civil works to provide a network connection to the customer's home or business premises.
- 6.108 We recognise that some of the reasons why these orders take so long to complete are not entirely within Openreach's control.¹⁷⁴ Examples include where Openreach is waiting for permissions from landowners and local authorities to conduct works or where it has to wait for its customers to agree particular matters, provide necessary information or to be given access to premises. While such periods of delay may be reasonably excluded from SLG payments under contractual terms, we consider that Openreach should continue to compensate telecoms providers for its part in protracted delays in completing these complex installations until the order has been completed. This will ensure Openreach remains subject to financial incentives to play its part in completing all orders.
- 6.109 We consider that, given the number of installations that exceed the current SLG caps, that it is appropriate that we intervene to incentivise Openreach to make improvements in this area insofar as it can. We therefore consider a change to the SLG cap to be necessary and have looked at two possible options, as set out below.

Extending the SLG cap

- 6.110 We consider that extending the 60 day cap would provide an incentive for Openreach to complete more late installations where otherwise those incentives would not exist and would increase its incentives to complete installations approaching the existing cap. For example, doubling the current SLG cap to 120 payable days would reduce the number of uncompleted installations at the cut-off point for the compensation cap to [3<].¹⁷⁵ Further, our estimates indicate that extending the cap to 120 payable days would increase annual SLG costs to Openreach by around £1.2m. However, Openreach would not be liable for the totality of this exposure due to the various exclusions contained within its contracts with telecoms providers to reflect matters that are not within its control.

¹⁷⁴ Even in these cases, we consider that there are steps Openreach can take to ensure that the process runs more efficiently, such as making timely applications for permissions.

¹⁷⁵ Based on 2015/16 data.

No SLG cap

- 6.111 Removing the current cap entirely would ensure that, in future, Openreach has incentives to complete all installations that experience delays of 60 or more days over the agreed delivery date. Specifically, in contrast to the status quo, there would be a financial incentive on Openreach to complete these orders. Our estimates indicate that not having a cap on late installation SLGs has the potential to increase annual SLG costs to Openreach of around £2.2m compared to the counterfactual of a 60 day cap. Again, we would not expect that Openreach would be liable for the total amount set out above due to the various exclusions contained within its contracts with telecoms providers to reflect matters that are not within its control. The SLGs would therefore maintain incentives on Openreach to play its part in completing all orders.

Assessment

- 6.112 Based on the above, we consider the arguments to be finely balanced. Theoretically, the longer the cap the greater the incentive on Openreach to address delayed installations. However, a longer cap also risks increasing costs and the potential for encouraging avoidance tactics or gaming.
- 6.113 As set out in Section 3, we consider that the justification for retaining caps on compensation is weak. We consider that removing the cap in its entirety is likely to maximise benefits to competition, telecoms providers, and consumers by ensuring Openreach remains incentivised to complete all installation orders placed with it. We place particular weight on this factor.
- 6.114 Set against these benefits, there are some extra costs in the form of an increase in SLG outpayments. However, our estimates indicate that increases in SLG outpayments are relatively modest. Moreover, the liability to which Openreach would be exposed would likely be significantly lower due to contractual exclusions where there are periods of delay which are outside Openreach's direct control.
- 6.115 Having regard to the level of costs identified above and the potential improvements in the effectiveness of the SLA/SLG regime, we are proposing to require Openreach to remove the existing 60 day cap on SLG payments. We consider that this will ensure that the incentive properties of SLGs do not diminish and will encourage Openreach to make material improvements in minimising long delays. We set out our considerations for imposing a direction to require the removal of compensation caps in Section 8 and notify a draft direction in Annex 8.

Transparency

- 6.116 We currently require Openreach to provide us with certain KPIs on the number of late installations and the periods of delay involved. While this information enables us to monitor certain trends around late installations, we do not have regular insights into the causes of delay.

6.117 We therefore propose to require Openreach to provide us with periodic reports¹⁷⁶ setting out the main causes for delays to late installation orders covering issues such as:

- the requirement for infrastructure build;
- surveys, planning, build and contractors;
- issues related to network capacity; and
- issues concerning permissions such as may be required from landlords, landowners, local authorities, etc.

6.118 We discuss this further in Section 7.

Improving the customer experience

6.119 We also propose that the OTA2 should work with Openreach and telecoms providers to explore initiatives aimed at improving the customer experience where installation orders face significant delays.

6.120 We consider that a key issue is ensuring that business processes and communications between Openreach and telecoms providers enable customers to be given early notice that their order will be delayed, the reasons for the delays, the provision of an accurate estimated delivery date at the earliest opportunity and regular progress updates.

6.121 We further consider that in cases where the customer has no voice and/or broadband service pending the completion of their installation order, Openreach and telecoms providers should look at practical options to provide the customer with a temporary and best efforts alternative service. Options might include the provision of mobile or satellite services, temporary lines or other radio communications.

Question 6.4: Do you agree with our proposals to minimise installation delays and improve the customer experience? Please provide reasons and evidence in support of your views.

Newly installed Openreach connections that are not working

6.122 In considering Openreach's performance in completing installations on time, we have also considered the issue of newly installed lines not working.¹⁷⁷ This is generally measured by the incidence of newly installed connections reported as not working within eight working days of the installation being reported as completed. We note that BT agrees to pay compensation to telecoms providers in some of its contracts (such MPF and GEA-FTTC) if it is notified within eight working days of completing the installation, the service was provided in a non-operational state and this was the fault of Openreach.

6.123 Newly installed lines not working is an issue which is monitored closely by the OTA2, and we have discussed this issue with them. We understand that the incidence of WLR and MPF installations that are or become non-operational immediately or soon after the installation has been completed has remained at a relatively low and stable

¹⁷⁶ Following further discussions with Openreach on the form and content of such periodic reports.

¹⁷⁷ By not working we also include not fully working.

state for a sustained period. Openreach's launch of its GEA-FTTC product (which requires connection of the fibre at the street cabinet to the working copper line to the customers' home or business premises to be served with superfast broadband) did experience higher instances of non-operational installations initially. However, this has receded as experiences in the field have identified common causes of failures and driven improvements in areas such as network records, installation procedures and workmanship.

- 6.124 In the light of the above, we do not consider that proposing regulatory standards for Openreach's performance in this area is appropriate and proportionate at the current time. However, we have confirmed with the OTA2 that, while the available evidence does not suggest a material concern with trends in Openreach's service performance in this area, there is scope for industry to undertake more work to further reduce instances of new installations not working. Given our concerns about the effects of installations not working as expected on both competition and consumers, we encourage further work by Openreach and telecoms providers, facilitated by the OTA2, to reduce levels of new installations not working. We also propose to introduce new transparency obligations to monitor the level of newly installed lines not working as expected. These requirements are discussed in Section 7.

Question 6.5: Do you agree with our proposals newly installed lines not working? Please provide reasons and evidence in support of your views.

Provisional conclusions

- 6.125 In this section, we have outlined our proposed remedies to address the competition concerns we have about Openreach's service performance in installing orders for its main network access services (WLR, MPF and GEA-FTTC) arising from our provisional findings that BT has SMP in the wholesale fixed access markets.
- 6.126 We have provisionally reviewed the appropriateness and effectiveness of our existing regulations for installations, having considered, among other things, changes in the relevant markets and Openreach's actual service performance since our last review in 2014. Having done so, we propose that imposing regulations on BT which set standards of performance on installations remain appropriate and necessary to make sure that telecoms providers can rely on effective and timely access to BT's network to provide services to customers.
- 6.127 We also propose that the levels of performance set under our regulations for the next three years should be higher than that which we considered appropriate and proportionate in our last review for the reasons set out above. Above all, our proposed regulations are aimed at delivering the benefits to consumers of more effective competition between rival telecoms providers where they have more certainty about the levels of service performance they can expect from Openreach in installing their orders for access to BT's network.

Question 6.6: Do you have any further comments on our proposals for regulating BT's service performance for installations? Please provide reasons and evidence in support of your views.

Section 7

Transparency of BT's service performance for repairs and installations

Introduction

- 7.1 In our 2016 NMR and March 2017 WLA Consultations, we have proposed to impose obligations on BT to provide wholesale network access in the Narrowband and WLA markets, including an obligation to do so on fair, reasonable, and non-discriminatory terms. We have also proposed a SMP condition which would require BT to publish all such information as to the quality of service in relation to network access as we direct from time to time.¹⁷⁸ As part of this review, we are proposing to impose a package of transparency requirements pursuant to these provisions as set out below. We consider that the proposals set out in this section would achieve our statutory duties and satisfy the relevant legal tests as set out in Section 8.

Summary of our proposals

- 7.2 In the light of the quality standards proposed in Sections 5 and 6, this section outlines the key performance indicators (KPIs) we propose that BT should be required to provide to Ofcom and industry in relation to specified aspects of its service delivery. We consider that these KPIs will allow us to continue effective monitoring of Openreach's provision and repair performance, and ensure that BT is not discriminating in its service performance between telecoms providers. A summary of the proposed KPIs is set out in the table below:

¹⁷⁸ This is summarised in Section 2.

Table 7.1: Proposed KPIs for MPF, GEA-FTTC, GEA-FTTP, SMPF, and WLR¹⁷⁹

Grouping		KPI	SML	MPF	GEA-FTTC	GEA-FTTP	SMPF	WLR
KPIs relating to QoS standards	Appointment availability			Y P GM	Y P GM	Y	x	Y P GM
	Provisioning of all orders			Y P GM	Y P GM	Y	x	Y P GM
	Repair completion	1		Y P GM	Y P GM	x	x	Y P GM
		2		Y P GM	Y P GM	Y GM	Y GM	Y P GM
		3		Y GM	Y GM	Y GM	Y GM	Y GM
		4		Y GM	Y GM	Y GM	Y GM	Y GM
KPIs to monitor quality more broadly	Average first available appointment date			Y P	Y P	Y	x	Y P
	Percentage of orders rejected			Y	Y	Y	x	Y
	Provisioning of appointed orders			Y	Y	Y	x	Y
	Average installation time			Y P	Y P	Y	x	Y P
	Percentage of installations affected by MBORC declarations that missed the Committed Date			Y	Y	Y	x	Y
	Percentage of orders reported as faulty			Y	Y	Y	x	Y
	Average time to restore service	1		Y P	Y P	x	x	Y P
		2		Y P	Y P	Y	Y	Y P
		3		Y	Y	Y	Y	Y
		4		Y	Y	Y	Y	Y
	Percentage of repairs affected by MBORC declarations that missed the SLA			Y	Y	Y	x	Y
	Average time to restore service for repairs that have exceeded the SLA by more than 20 working days	1		Y	Y	x	x	Y
		2		Y	Y	Y	Y	Y
		3		Y	Y	Y	Y	Y
		4		Y	Y	Y	Y	Y
	Percentage of repeat faults			Y	Y	Y	Y	Y
	Percentage of installed base reported as faulty			Y	Y	Y	Y	Y
	Percentage of missed installation appointments			Y P			x	Y P
	Percentage of missed repair appointments			Y P				Y P

¹⁷⁹ 'Y' means that BT would be required to provide this information to Ofcom and industry. The precise information that must be provided to industry may differ against that provided to Ofcom although, for reasons of clarity, we have not sought to represent these differences within this table. 'P' means that BT would be required to publish this information on its website every three months, commencing 20 June 2018 (in addition to providing this information to industry and Ofcom). 'GM' means that the data BT provided must be disaggregated between each GM region (Scotland, North East, North West, North Wales & North Midlands, South Wales & South Midlands, Wessex, South East, London, East

- 7.3 Further, we have set out proposals to require BT to provide a report on service failures that fall outside of the quality standards we propose in Sections 5 and 6. Our proposals seek to provide greater transparency around these aspects of Openreach's performance and to allow us to identify any potential areas of concern.

Background and context

- 7.4 In the 2014 FAMR we imposed directions which require BT to report to industry and Ofcom a set of KPIs relating to its service performance for WLR, ISDN30, ISDN2, LLU (MPF and SMPF), and GEA (FTTC and FTTP). A sub-set of these KPIs must be published with unrestricted access on a BT Group website every three months, within 14 working days of the end of that three-month period.¹⁸⁰ Our 2016 Directions and Consents¹⁸¹ subsequently extended reporting obligations to repairs of MPF faults subject to service maintenance level 1 (SML1) in light of telecoms providers' movements between care levels for this service.

Aim and effect of regulation

- 7.5 Transparency measures are one of three complementary regulatory tools we have previously relied on to address the competition concerns we have identified in relation to Openreach's incentives to provide a sufficient level of quality in the provision of network access.¹⁸² These measures may include requirements on BT to provide KPIs on key aspects of Openreach's quality and can support our network access remedies by allowing Ofcom, industry, and the wider public to monitor aspects of its service performance.
- 7.6 As set out in Section 3, BT, as a vertically integrated operator provisionally found to have SMP in Narrowband and WLA markets, has the ability and incentive to use its SMP to favour its own divisions competing with rival telecoms providers. This could have a material adverse effect on competition in downstream markets. Such discriminatory conduct could take various forms including, for example, Openreach providing a better quality of service to BT divisions than to non-BT firms.
- 7.7 Transparency measures, such as the disclosure of KPIs, can also help ensure that network access is provided on fair, reasonable, and non-discriminatory terms. They do so by making the service performance Openreach provides to BT businesses and rival telecoms providers visible or transparent and more easily detectable. KPIs therefore act as a deterrent against engaging in such discriminatory behaviour.
- 7.8 The publication of KPI data to Ofcom also allows us to closely monitor Openreach's service and observe trends in performance over time. This means we can not only assess performance for services subject to regulatory QoS standards, but we can also monitor aspects performance more broadly, thereby encouraging Openreach to focus on delivering quality more broadly, without the need to impose potentially more onerous forms of regulation unless required. As in the 2014 FAMR, we have also

Anglia, and Northern Ireland). Where the 'GM' marking is not used, BT would be only required to publish KPIs in relation to the United Kingdom as a whole. 'x' means that BT would not be required to provide any information in relation to this KPI.

¹⁸⁰ See 'Homes and smaller businesses':

<https://www.homeandwork.openreach.co.uk/OurResponsibilities/our-performance.aspx> [accessed 14 March 2017].

¹⁸¹ Ofcom 2016, Quality of Service for WLR and MPF

¹⁸² The other two are service level agreements/service level guarantees (SLAs/SLGs) and QoS standards.

considered requiring Openreach to publicly disclose certain KPIs, which will make areas of its service delivery transparent to all interested parties.

- 7.9 We consider the KPIs we are proposing can be used to resolve information asymmetries and to observe trends in performance (as described above), and that these KPIs will support the SMP obligations we have proposed as part of our 2016 NMR and March 2017 WLA Consultations, as well as the QoS remedies we are proposing elsewhere in this consultation.

Structure of this section

- 7.10 In the light of our proposed quality of service remedies set out in Sections 5 and 6, this section:
- first, defines our proposals to maintain the KPI monitoring regime for Openreach's service performance for repairs and installations over the market review period, albeit with a number of modifications; and
 - second, outlines proposals requiring BT to publish a new report which provides information about fault repairs and installations which fall outside of the proposed regulatory standards, such as the key causes of delays in repairs and installations.

QoS transparency proposals

Key performance indicators (KPIs)

- 7.11 For the reasons summarised above, we consider that requiring BT to continue to regularly report KPIs is appropriate and necessary so that we can closely monitor Openreach's performance. KPIs enable us to effectively monitor compliance with repair and installation standards, as well as with BT's obligations in relation to the provision of network access. They also provide transparency around metrics where we see the potential for QoS concerns, but which do not currently warrant more intrusive regulation such as quality standards.
- 7.12 We are therefore proposing to maintain KPI reporting requirements on BT; however, we have undertaken a review of the current set of KPIs to ensure that it remains fit for purpose in the light of our proposed QoS standards, the extension of regulation to GEA-FTTC, and the QoS concerns identified in this review. In particular, we have considered which KPIs should be retained, revised, added, and/or removed.
- 7.13 Having completed this review, the following table demonstrates how our proposals modify the existing set of KPIs imposed in the 2014 FAMR. We note that we have proposed to remove a number of the 'volumes' KPIs on the basis that they can be combined with other KPIs or that data for them can be extracted from other KPIs, which we consider helps to ensure that the reporting burden on BT does not become disproportionate.

Table 7.2: Proposed modifications to the 2014 FAMR KPIs

KPI	Proposal	Reasoning
Percentage of orders rejected	Retain	Remains an important area of QoS to monitor
Percentage of appointed orders provisioned on time	Retain, but modify	Remains an important area of QoS to monitor
Percentage of orders provisioned on time	Retain, but modify	Relates to a proposed quality standard
Percentage of orders reported as faulty	Retain, but modify	Remains an important area of QoS to monitor
Percentage of installed base reported as faulty	Retain	Remains an important area of QoS to monitor
Appointment availability	Retain, but modify	Remains an important area of QoS to monitor
Average installation time (requiring an engineering visit)	Retain	Remains an important area of QoS to monitor
Average installation time (not requiring an engineering visit)	Retain	Remains an important area of QoS to monitor
Average installation time (all order types)	Remove	No longer required
Average time to restore service	Retain, but modify	Remains an important area of QoS to monitor
Percentage of faults restored on time for services subject to SML1	Retain	Relates to a proposed quality standard
Percentage of faults restored on time for services subject to SML2	Retain	Relates to a proposed quality standard
Percentage of faults restored on time for services subject to SML3	Retain	Remains an important area of QoS to monitor
Timing of fault repairs	Remove	No longer required
Percentage of repeat faults	Retain	Remains an important area of QoS to monitor
Gateway availability (excluding Scheduled Outages)	Remove	No longer required
Gateway availability (including Scheduled Outages)	Remove	No longer required
Volume of orders submitted	Remove	No longer required
Volume of orders completed	Remove	No longer required
Volume of installed base	Remove	No longer required
Volume of completed faults	Remove	No longer required
Volume of installations affected by MBORC declarations	Retain, but modify	Remains an important area of QoS to monitor
Volume of repairs impacted by MBORC declarations	Retain, but modify	Remains an important area of QoS to monitor
Timing of fault repairs	Remove	No longer required
Total fault repairs	Remove	No longer required
Timing of first available appointment dates	Remove	No longer required
Total appointed orders	Remove	No longer required
Timing of appointed orders not provisioned on time	Remove	No longer required
Total appointed orders that did not become completed orders	Remove	No longer required

7.14 The following sub-section now sets out the KPIs against which we propose BT is required to report.¹⁸³

Proposed KPIs

KPIs relating to QoS standards

- *Appointment availability:* We propose to modify the current ‘timing of first available appointment dates’ KPI such that it provides data against the proposed appointed availability standards and at a number of working days after the time period we have specified expires. This will allow us to monitor compliance against the standards at the regional level, and also ensures transparency in the treatment of services which fall outside of them.
- *Provisioning of all orders:* We propose to modify the existing KPI such that over the market review period we are able to monitor Openreach’s performance against the delivery date certainty standard on both a service basis and a regional basis, as well as installations that are completed a number of working days late.¹⁸⁴
- *Repair completion:* We propose to combine the existing ‘percentage of faults restored on time subject to SMLx’ and ‘timing of fault repairs’ KPIs into a single KPI. At each care level, data should be reported for repairs completed on time and at a number of days beyond the SLA. This will allow us to monitor compliance against the on time standards at the regional level, and also ensures transparency in the treatment of services which fall outside of them. In contrast to the FAMR, we also propose to expand reporting requirements to SML4 so that we have visibility on repair performance at the highest care level where we have not imposed QoS standards.¹⁸⁵

KPIs to monitor quality more broadly

- *Average first available appointment date:* We consider that this remains an important metric to monitor, especially as our proposed QoS standards increase over the coming review period. We note that we propose to change the name of this KPI from ‘appointment availability’ to ensure the description of the KPI better reflects the data we consider BT should report.
- *Percentage of orders rejected:* We would be concerned if, as our proposed quality standards increase, there was a similar rise in the percentage of orders rejected. We consider that this could reflect poor quality by Openreach in terms of installing lines for telecoms providers, thereby resulting in an unreasonable proportion of orders being rejected. We therefore consider that this KPI remains an important metric to monitor over the coming review period.
- *Provisioning of appointed orders:* We propose to expand the existing KPI such that it provides transparency around orders installed on time and a number of working days beyond the Committed Date. Also, we consider that this KPI will

¹⁸³ We have focused on the nature of the KPIs themselves. Service scope, geographic scope, care level scope, and availability on a public website are summarised in Table 7.3.

¹⁸⁴ Specifically, one, two, five, 10, and 20 working days over the Committed Date.

¹⁸⁵ The denominator of this KPI will provide the volumes of completed faults at each care level such that we consider it no longer necessary for BT to report a separate KPI on ‘volume of completed faults’.

enable us to track relative performance for appointed and non-appointed orders in order to monitor potential discrimination.

- *Average installation time for appointed and non-appointed orders:* We consider that this remains an important metric to monitor, especially as our proposed QoS standards increase over the coming review period. Combining data for the average installation times for orders requiring an engineer visit and those not requiring an engineer visit will allow us to see average installation times for all orders, and we therefore do not consider it necessary that BT continues to report a separate KPI for all orders.
- *Percentage of installations affected by MBORC declarations that missed the Committed Date:* We propose to modify the current KPI for the 'volume of installations affected by MBORC declarations' which by definition only relates to installations subject to MBORC that have also missed the Committed Date.¹⁸⁶ The data we currently receive will become the numerator for the revised KPI, while the denominator will tell us the total volume of installation affected by MBORCs. We consider this KPI necessary to ensure that BT's use of MBORCs would be open to scrutiny and that any trends or biases in the declaration of MBORCs would be visible.
- *Percentage of orders reported as faulty:* We consider that this KPI in its current form should be modified to enable us to monitor rates of 'Dead on arrivals' ('DoAs'¹⁸⁷) and 'Early life failures' ('ELFs'¹⁸⁸) over the review period. Increasing DoA or ELF rates could be a signal of poor Openreach workmanship which, in turn, affects the provision of network access to telecoms providers.
- *Average time to restore service:* We consider that this remains an important metric to monitor, especially as our proposed QoS standards increase over the coming review period. We propose to extend the scope of this KPI to also cover SML4 which is consumed primarily by businesses.
- *Percentage of repairs affected by MBORC declarations that missed the service level agreement:* We propose to modify the current KPI for the 'volume of repairs impacted by MBORC declarations' which by definition only relates to repairs subject to MBORC that have also missed the SLA.¹⁸⁹ The data we currently receive will become the numerator for the revised KPI, while the denominator will tell us the total volume of repairs impacted by MBORCs. We consider this KPI necessary to ensure that BT's use of MBORCs would be open to scrutiny and that any trends or biases in the declaration of MBORCs would be visible. The data will also provide an essential input for the MBORC allowance calculations for the repair QoS standards.
- *Average time to restore service for repairs that have exceeded the SLA by more than 20 working days:* This KPI allows us to monitor repairs that take over 20 working days over SLA to complete, to assess, for example, whether increase

¹⁸⁶ We note that an installation subject to an MBORC declaration will not necessarily miss the Committed Date. There is a proportion of installations subject to MBORCs that are still completed on time.

¹⁸⁷ Dead on arrival means a fault with a telecoms service within eight calendar days of installation.

¹⁸⁸ Early life failure means a fault with a telecoms service within 28 calendar days of installation.

¹⁸⁹ We note that a fault subject to an MBORC declaration will not necessarily miss its repair SLA. There is a proportion of repairs subject to MBORCs that are still completed on time.

in performance required to meet the proposed QoS standards results in a degradation in time to repair for some customers.

- *Percentage of repeat faults:* While we are not proposing specific regulation around repeat faults in this review, we consider this is an important area to monitor over time. In particular, we would be concerned if the repeat fault rate for any access service rose as a direct consequence of higher QoS standards (see Annex 6 for further information).
- *Percentage of installed base reported as faulty:* This KPI will allow us to monitor one measurement of fault rates for each of Openreach's wholesale access services. As the denominator will allow us to track volumes of connections over time, we therefore do not consider it necessary that BT continues to report a separate 'volume of installed base' KPI.
- *Percentage of missed installation appointments and percentage of missed repair appointments:* Appointments missed by Openreach engineers has been an area of concern for a number of stakeholders. We consider that data should be made public in order to provide industry and consumers with greater transparency regarding BT's performance, and to hold BT to task as regards to its commitments in relation to missed appointments.¹⁹⁰

Reporting obligations

Monthly KPIs

- 7.15 The 2014 FAMR requires KPI data to be submitted within 14 working days of the last working day of every month in respect of the previous month. We have not found any issue with this approach and therefore propose to continue the requirement over the coming review period.
- 7.16 However, consistent with our 2016 Directions and Consents, we propose 14 working days plus one month for the reporting of percentages of both repairs and installations affected by MBORC declarations that missed the SLA or Committed Date, respectively.¹⁹¹ We understand that MBORC data is subject to a validation process which would be ongoing at the time when KPI data is reported to Ofcom. In the interest of us receiving accurate data (that is not subject to restatements), we continue to believe it is appropriate to grant BT extra time to report these KPIs. We do not consider that the one-month delay will materially impact on our monitoring of Openreach's overall performance.

Quarterly website publication

- 7.17 As stated above, a subset of the current KPIs must be published on a BT Group website every quarter, specifically within 14 working days of the end of the previous month. This has enabled improved transparency to customers and interested parties of key elements of Openreach's service performance in carrying out repairs and installations. We believe this requirement allows customers to see the performance of the service supplied by Openreach to telecoms providers and help avoid potential

¹⁹⁰ We note that during 2016/17 Openreach began to share missed appointment figures voluntarily on its website, although the lack of a regulatory obligation to do so risks this information being removed or discontinued at any time.

¹⁹¹ That means, for example, that data for April 2018 must be delivered to Ofcom by 20 June 2018.

misconceptions about relative differences in service quality between telecoms providers who rely on the same Openreach services.

- 7.18 We therefore consider it appropriate and necessary to require BT to continue to publish a number of key KPIs on its website (without password access) on a quarterly basis. We have set out our proposals in Table 7.3 and intend to discuss with BT how the data is presented following the publication of this consultation. Again, we consider 14 working days sufficient time for BT to be able to report the public KPIs and propose to continue to use this a deadline within the draft KPI directions.

Geographic scope

- 7.19 The 2014 FAMR requires that, in addition to providing data for the UK as a whole, BT publishes certain KPIs split by reference to each of the ten regions of the UK. We considered that there was a risk of substantial variations in service delivery between different regions and hence it was important that we were able to monitor and compare performance in each area.
- 7.20 We consider that the risk of such variations persists over the forward-looking period of this review. Given the importance of ensuring that performance is nationally consistent and that BT is not able to trade off quality to the detriment of customers in certain regions, we consider it is essential that KPIs publish regional performance. As summarised in Table 7.3, we therefore propose that KPIs relating to aspects of service which correspond to our proposed QoS standards are reported by BT on a regional basis.¹⁹²

Service scope

- 7.21 The 2014 FAMR requires that BT provides KPI for each of its key network access services. Even though we are proposing to combine services for the purposes of compliance with our proposed quality standards, we propose to continue to require KPIs to be broken down such that we can monitor and compare trends in Openreach's performance for individual services. We consider this remains necessary in order to identify:
- emerging issues particular to certain services (e.g. as between existing copper-based services and newer fibre-based services); and
 - potential discriminatory conduct where certain telecoms providers or groups of telecoms providers (e.g. as between BT divisions and rival providers) consume particular Openreach wholesale network access services.
- 7.22 For clarity, we are proposing KPIs in relation to Openreach's installation and repair performance for WLR, MPF, SMPF, GEA-FTTC, and GEA-FTTP services.

¹⁹² We note that we propose to measure compliance with the proposed standards for repairs completed five working days over SLA on a national basis, but consider it important that we have visibility on Openreach's performance against this standard at a more granular level.

KPIs for the industry and BT downstream

- 7.23 For each of the KPIs, we propose that information is supplied for the industry as a whole and separately for BT's downstream units. This allows for the identification of any potential discrimination in service provision between telecoms providers and, in doing so, supports the network access requirement we are proposing in the Narrowband and WLA markets.

Numerators and denominators

- 7.24 For each of the percentage-based KPIs, e.g. *the percentage of orders rejected*, we propose that BT supplies both the numerator and the denominator used to calculate the primary KPI values. This is consistent with current practices and we consider it would allow us to rationalise the existing KPI list.

Future developments

- 7.25 We will keep our transparency requirements under review to ensure they continue to meet the aims we have set out above as the Narrowband and WLA markets develop over the review period. We may therefore seek to add to, withdraw, or modify our obligations going forward where we consider it appropriate to do so and subject to public consultation.
- 7.26 One area where we anticipate this might be appropriate would be if Openreach begins the commercial availability of GEA-FTTC services to subject to SML1. We would likely propose to require BT to report KPIs for this service/SML combination, split by GM area and/or published on a public accessible website (as directed by Ofcom), in the event that active connections in the relevant region exceed 100,000.

Summary

- 7.27 A summary of the proposed KPIs is set out in the following table:

Table 7.3: Proposed KPIs for MPF, GEA-FTTC, GEA-FTTP, SMPF, and WLR¹⁹³

Grouping	KPI	SML	MPF	GEA-FTTC	GEA-FTTP	SMPF	WLR
KPIs relating to QoS standards	Appointment availability		Y P GM	Y P GM	Y	x	Y P GM
	Provisioning of all orders		Y P GM	Y P GM	Y	x	Y P GM
	Repair completion	1	Y P GM	Y P GM	x	x	Y P GM
		2	Y P GM	Y P GM	Y GM	Y GM	Y P GM
		3	Y GM	Y GM	Y GM	Y GM	Y GM
		4	Y GM	Y GM	Y GM	Y GM	Y GM
KPIs to monitor quality more broadly	Average first available appointment date		Y P	Y P	Y	x	Y P
	Percentage of orders rejected		Y	Y	Y	x	Y
	Provisioning of appointed orders		Y	Y	Y	x	Y
	Average installation time		Y P	Y P	Y	x	Y P
	Percentage of installations affected by MBORC declarations that missed the Committed Date		Y	Y	Y	x	Y
	Percentage of orders reported as faulty		Y	Y	Y	x	Y
	Average time to restore service	1	Y P	Y P	x	x	Y P
		2	Y P	Y P	Y	Y	Y P
		3	Y	Y	Y	Y	Y
		4	Y	Y	Y	Y	Y
	Percentage of repairs affected by MBORC declarations that missed the SLA		Y	Y	Y	x	Y
	Average time to restore service for repairs that have exceeded the SLA by more than 20 working days	1	Y	Y	x	x	Y
		2	Y	Y	Y	Y	Y
		3	Y	Y	Y	Y	Y
		4	Y	Y	Y	Y	Y
	Percentage of repeat faults		Y	Y	Y	Y	Y
	Percentage of installed base reported as faulty		Y	Y	Y	Y	Y
	Percentage of missed installation appointments		Y P			x	Y P
	Percentage of missed repair appointments		Y P				Y P

¹⁹³ 'Y' means that BT would be required to provide this information to Ofcom and industry. The precise information that must be provided to industry may differ against that provided to Ofcom although, for reasons of clarity, we have not sought to represent these differences within this table. 'P' means that BT would be required to publish this information on its website every three months, commencing 20 October 2014 (in addition to providing this information to industry and Ofcom). 'GM' means that the data BT provided must be disaggregated between each GM region and Northern Ireland. Where the 'GM' marking is not used, BT would only be required to publish KPIs in relation to the United Kingdom as a whole. 'x' means that BT would not be required to provide any information in relation to this KPI.

Question 7.1: Do you agree with our proposals relating to the KPI reporting obligations set out above? Please provide reasons and evidence in support of your views.

Transparency for repairs and installations outside of the QoS standards

- 7.28 We believe that our new quality of service standards will encourage a significant improvement in Openreach's repair and installation performance that should result in the vast majority of customers experiencing repairs being completed within expected timeframes and having the services they ordered installed on time. However, there will be a small proportion of customers who still experience delays in repairs and installations, and we are concerned that there is currently little information available to us, industry, and customers regarding the causes of delays. We believe this lack of transparency has a negative impact on competition because it reduces the trust that telecoms providers and customers have in Openreach's operations. This can undermine telecoms providers' communications with their customers and, in turn, customers' confidence in switching between competing providers.
- 7.29 To address this concern we propose to introduce enhanced transparency by requiring BT to provide to Ofcom a standalone quarterly report including details of the root causes of delays for repairs and installations that are experiencing long term issues. Such a report would enable us to better monitor why some repairs and installations take a long time to complete, which we expect will incentivise BT to address recurrent problems, thereby enhancing the effectiveness of our network access remedy and improving consumer outcomes.
- 7.30 We propose to work with Openreach to determine the form and content of the report, such that it extracts information that Openreach currently holds where possible or otherwise specifies information that we consider Openreach should be reasonably expected to record going forward.¹⁹⁴
- 7.31 Our provisional view is that the report should provide information on Openreach orders to carry out repairs and installations which have exceeded the SLA or Committed Date, respectively, by more than 120 working days. We have proposed 120 working days as an appropriate trigger for this additional reporting requirement based on our judgement. Our intention is to focus on the most extreme cases of delay but without creating a reporting requirement which is unduly burdensome.
- 7.32 The type of information we provisionally consider should be included in the report (subject to further discussion with Openreach) includes:
- a) the number of incomplete repairs and installations that are exceeding the SLA or Committed Date, respectively, by more than 120 working days at the beginning and end of the quarter;
 - b) how delayed beyond the 120 working days over SLA or Committed Date these incomplete orders are;
 - c) the relevant wholesale services and telecoms providers to which the incomplete repairs and installations relate;

¹⁹⁴ Consistent with our KPI proposals, we consider that the scope of the standalone report should relate to the installation and repair of WLR, MPF, SMPF, GEA-FTTC, and GEA-FTTP services.

- d) the locations of the incomplete repairs and installations;
- e) the key cause(s) of the delays;
- f) summary details of plans to complete works, including estimated completion dates; and
- g) summary details of communications and complaints concerning the incomplete repairs and installations.

7.33 We also provisionally propose that a subset of this information is published on a BT Group website shortly after the end of every quarter, so that it is freely and readily accessible to telecoms providers and their customers.

Question 7.2: Do you agree with our proposal to require BT to submit a quarterly report on late repairs and installations, and the reasons for their delay? Please provide reasons and evidence in support of your views.

Provisional conclusions

7.34 In this section, we have outlined our proposed transparency remedies which we consider are appropriate, proportionate, and necessary to complement our proposed quality of service standards. Together, we consider they will ensure that the network access we require BT to provide is timely and effective, and addresses the competition concerns we have about quality arising out of our provisional findings that BT holds SMP in the relevant wholesale markets. We have reviewed the effectiveness of the existing transparency obligations with a view to determining whether amendments should be made or additional measures are appropriate. Consequently, we have proposed a number of transparency requirements aimed at monitoring performance, potential discrimination, and instances of extended delays.

7.35 Table 7.3 above summarises our proposals to direct BT to provide quality of service KPIs every month in respect of Openreach's WLR, LLU (MPF and SMPF), and GEA (FTTC and FTTP) network access services. We have also set out our proposals for new reports on delayed repairs and installations. These proposals are made under the quality of service SMP conditions which we have proposed and notified in the 2016 NMR and March 2017 WLA Consultations. The legal instruments setting out our notification of draft directions to give effect to our proposals is at Annex 8.

Question 7.3: Do you have any further comments on our proposals for transparency around Openreach's service performance? Please provide reasons and evidence in support of your views.

Section 8

Proposed quality of service remedies

Introduction

- 8.1 In the preceding sections, we have set out our approach to setting quality of service remedies covering WLR, MPF, and GEA-FTTC services. We have proposed requirements for BT that cover repair and installation performance, transparency obligations, and proposals for how to reflect forecast improvements in network reliability in our proposed charge control models.
- 8.2 In this section, we consider the effects of our proposed requirements in aggregate and set out our consideration of how our proposals meet the necessary legal tests. We also set out our proposals and draft directions relating to Service Level Guarantees (SLGs).
- 8.3 The remainder of this section is set out as follows:
- first, we summarise our proposed remedies and assess the total package of proposed remedies against the criteria we set out in Section 3;
 - we then consider whether our proposals satisfy the legal tests in the Communications Act 2003 ('the Act'), and consider them in the light of the relevant EC recommendations and Body of European Regulators for Electronic Communications (BEREC) common positions; and
 - finally, we set out our proposals to remove the cap on the payment period for SLGs, and close with our proposals for how SLGs should be negotiated.

Assessment of our proposed package of remedies

- 8.4 In Section 5, we propose to set standards for BT's fault repair performance, which rise to 93% of repairs to be completed within the service level agreement (SLA) relevant to the service maintenance level (SML) purchased, and 97% to be completed in no more than five working days after that SLA. These are shown in Tables 8.3 and 8.4 below.
- 8.5 In Section 6, we propose to set standards for BT's installation performance, requiring installation appointments to be available within a ten-day period in 90% of cases by the third year of the market review period. We also propose that, when an installation date has been agreed with the customer, it should be met in 95% of cases by the third year of the review. These are shown in Tables 8.5 and 8.6 below.
- 8.6 As set out in Section 3, the factors we have considered in assessing the levels at which we should set the standards are:
- the benefits to competition, customers, and telecoms providers, in particular regarding providing certainty around (i) the quality of the service telecoms providers are purchasing and (ii) the waiting times customers will experience for an installation or repair;

- how operationally feasible it is for Openreach to achieve standards within the timeframe of the review period; and
- the resource implications, and consequent impact on costs for customers and telecoms providers.

8.7 We set out our assessment of our complete package of repair and installation proposals against these criteria below.

Our proposals in relation to customer needs and certainty

- 8.8 Sections 5 and 6 present our assessment of the benefits to customers, telecoms providers, and competition for each of the standards we propose. In aggregate, we consider our proposals to have a positive reinforcing effect. Customer confidence in high standards in one aspect of the service they buy can be eroded by poor quality in other aspects of the same service.
- 8.9 In contrast, generally high quality in all aspects of service delivery should give customers confidence in their use of their services and in their ability to switch without fear of disruption and loss of service.
- 8.10 Further, as customers are becoming increasingly reliant on telecoms services and place greater value on them, progressively higher standards prevent a potential escalation in consumer harm.
- 8.11 High standards should also give telecoms providers the confidence to develop service packages that meet customer needs, without fear of damage to their brand image. At present, an 80% repair standard for services subject to SML2 means that one in five customers will be let down if telecoms providers set expectations of a next day repair. At our proposed 93% on time repair standard, combined with the 97% control on repairs completed five working days over SLA, there is the potential for greater differentiation between telecoms providers in terms of the service promises they make, that are based on their own service capability, rather than constrained by Openreach.
- 8.12 Greater certainty over installation performance should also give telecoms providers better control over customers switching to their services, which will reduce the probability that Openreach adversely affects the important first experience a customer has with a new telecoms provider.
- 8.13 Therefore, we consider that separately, and in combination, our proposals address our criteria in relation to customer needs and certainty.

Our proposals in relation to operational feasibility

- 8.14 In the 2014 FAMR we set quality standards aimed at returning performance to levels that had previously been observed. In this review, we propose standards that BT has either not achieved, or has not consistently achieved across all its geographic regions. We recognise that this will require BT to make changes to its operations and potentially its interactions with telecoms providers. We also recognise that our proposed repair performance standards reach a level that BT claims is operationally infeasible (although we demonstrate our disagreement with this claim in Section 5).
- 8.15 We have addressed these potential concerns by adopting non-linear glidepaths to reach our proposed final year targets. Our aim is to balance continuous

improvements in the service customers receive with giving BT time to make the necessary changes to its operations to deliver to at least our proposed requirements in an efficient and sustainable manner.

- 8.16 To that end, the increase in the on-time repair standards we have proposed for the first year of the review period is deliberately modest relative to the current standards. We recognise BT will need to increase its resources and invest in the skills and equipment of its engineers to achieve the final year target. For installations, we have set the proposed standards at a level designed to prevent any deterioration in current performance while BT makes the necessary changes to its operations to achieve higher standards in the final year. We have also set the standards below the theoretical operational ceiling we believe Openreach can achieve.
- 8.17 Our proposals with respect to fault rates in the accompanying charge control to the WLA market review are also relevant here. If BT undertakes its proposed investment in fault volume reduction, the resulting reduction in repair effort should free engineers for any necessary retraining and embedding of new ways of working.
- 8.18 In effect, we anticipate that there is a potential operational virtuous circle that BT can exploit, and that the glidepaths we intend to use for our proposed increases in the quality standards are designed to give it the opportunity to do so.
- 8.19 Therefore, while we acknowledge that our proposals are challenging, we believe it is operationally feasible for Openreach to achieve them over the review period.

Our proposals in relation to costs to customers and telecoms providers

- 8.20 We set out in Annex 7 our methodology for assessing Openreach resource uplifts associated with different levels of quality standards. We have used the model outputs in conjunction with our charge control models to estimate the cost impact of our proposed quality of service regulation. Our estimate of the resulting cost impact is set out below for the two services for which we propose to set charge controls.¹⁹⁵

Table 8.1: Nominal price impact on charge controls in 2020/21

Service	Service Maintenance Level (SML)	Cost Impact £s per annum per line	Percentage impact on proposed charge control
MPF	1	£0.62	<1%
GEA-FTTC 40/10	2	£0.36	<1%

- 8.21 In our judgement, the direct impact on the level of the charge controls on MPF SML1 and GEA 40/10 services at SML2 that are attributable to our proposals are modest when compared to the significant improvement in the quality of services that customers will receive, as well as the competition benefits of improved certainty. Our research on willingness to pay has shown that the customer base is heterogeneous, with some customers willing to pay for better, faster service, and some willing to accept a discount for slower service. As set out in in Section 3, we consider that

¹⁹⁵ In the 2016 NMR Consultation, we have proposed pricing flexibility for Openreach regarding WLR, and we propose pricing freedom for MPF service subject to SML2 in the March 2017 WLA Consultation (published alongside this document). Our general access conditions, including the requirement for fair and reasonable prices, continue to apply.

providing more certainty over the quality that Openreach will provide means that telecoms providers can make a meaningful choice between the different service maintenance levels, and thus they can select the price-quality trade off that is appropriate for their customers. In turn, that should ensure the continued effectiveness of the network access remedies that we are proposing.

- 8.22 We believe that our strategy of increasing quality standards has increased BT's focus on improving quality. We think that it has spurred BT to look for ways to reduce fault rates to a more efficient level, which should lead to a significant operating cost saving. The effect of this reduction in faults on the cost of MPF SML1 will be to reduce costs by £2.21 per line per year (nominal terms in 2020/21). As such, the total cost of repairing customer lines on the Openreach network, taking into account the reduction in fault rate (£2.21 reduction) and the faster speed of repair that we propose (£0.62 increase per line per year), is going down by £1.59, and we would expect this to feed through to lower prices for customers.

Question 8.1: Do you agree with the combination of proposals we have made regarding quality of service for repair and installation and regarding faults? Please provide reasons and evidence in support of your views.

Question 8.2: In Annex 7 we set out our analysis and estimates of the resource implications of quality standards, including the assumptions and results of the Resource Performance Model that we commissioned consultants to develop. Please state whether you agree with our approach and estimates as set out in Annex 7. Please provide reasons and evidence in support of your views.

Consideration of the legal tests for imposing quality of service regulations

- 8.23 In Annex 8, we set out:

- a proposed direction which imposes on BT, for MPF, WLR and GEA-FTTC, requirements to meet defined service standards, which increase over each of the three years of these forward-looking market reviews, in respect of:
 - completing the repair of faults within SLA timescales;
 - completing the repair of faults which exceed specified SLA timescales by a further five working days;
 - the period within which BT must offer appointments (where required) for the installation of WLR, MPF and GEA-FTTC services; and
 - completing the installation of WLR, MPF and GEA-FTTC services on the date agreed with the customer.
- proposed directions on transparency as to quality of service (notified at Annex 8) which impose on BT, in the supply of WLR, MPF, SMPF, GEA-FTTC, and GEA-FTTP services, requirements to provide specified key performance indicators (KPIs) and specified reports; and
- proposed directions relating to SLGs (notified at Annex 8) which impose on BT, requirements to modify the terms and conditions of its relevant contracts for the supply WLR, MPF and GEA-FTTC services, to raise the existing caps on the

number of days' compensation that may be payable in the circumstances provided for in the direction.

- 8.24 Below we describe our proposals in more detail and set out our considerations for how they meet the relevant legal tests under the Act and are consistent with relevant EC recommendations and BEREC common positions.
- 8.25 We have also included in Annex 8, proposed changes to certain draft legal instruments notified in our 2016 NMR Consultation. These changes reflect more recent proposals which we have made in our March 2017 WLA Consultation not to re-impose the 2008 SLG directions and include certain key elements of those directions in BT's SMP Reference Offer condition.

Proposals to impose quality of service standards

Current regulation

- 8.26 As set out in Section 2, in the 2014 FAMR, we undertook a review of matters relating to quality of service delivered by BT (through Openreach) in the supply of regulated wholesale fixed access services (which included the WFAEL, wholesale ISDN30¹⁹⁶, and wholesale ISDN2¹⁹⁷ markets).¹⁹⁸ We determined that over several years (from 2009) there had been a gradual decline in Openreach's performance, particularly in relation to fault repairs and installations for WLR and MPF services. We also concluded that the prevailing regulatory and contractual framework had not been sufficient to prevent material detriment to downstream competition in the fixed access markets, arising out of BT's SMP.
- 8.27 As a result of the observed decline in BT's performance, we imposed on BT a number of new SMP obligations, including setting service quality standards covering installation and repair for WLR and MPF, the main copper-based access services.¹⁹⁹
- 8.28 We set QoS standards on how quickly Openreach offered an appointment for engineering visits for installations and on the proportion of installations completed by the contractually agreed date, each with a fixed 1% allowance for local 'Matters Beyond Our [BT's] Reasonable Control', or 'MBORC' events (often referred to as *force majeure*).²⁰⁰
- 8.29 In terms of repair, we decided it was appropriate set a QoS standard on the proportion of repairs completed within the contractual SLAs, with a fixed 3% allowance for local MBORC events.

¹⁹⁶ ISDN30: A digital narrowband access service supporting up to 30 64kbit/s channels, which is used most commonly to provide multiple telephone lines to larger businesses.

¹⁹⁷ ISDN2: A digital narrowband access service for businesses which provides two 'channels' at 64kbit/s each.

¹⁹⁸ <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/telecoms-competition-regulation/narrowband-broadband-fixed/fixed-access-market-reviews-2014>.

¹⁹⁹ We imposed these annual standards in each of Openreach's ten geographic regions (East Anglia, London, North East, North Wales & North Midlands, Northern Ireland, Scotland, South East, South Wales and South Midlands, and Wessex).

²⁰⁰ MBORC means a *force majeure* event that releases Openreach from the liability to make any payment under the corresponding SLG. We also allowed BT to make use of what are referred to as 'High Level MBORC' declarations within the performance calculations for up to two regions per year.

- 8.30 The installation and repair standards increased over the three-year, forward-look period of the 2014 FAMR, as summarised by Table 8.2 below:

Table 8.2: Openreach quality standards for WLR and MPF services²⁰¹

QoS standard	First year (2014/15)	Second year (2015/16)	Third year (2016/17)
12 day provision appointment availability	55% (54%)	68% (67%)	80% (79%)
Provision completion by Committed Date	90% (89%)	90% (89%)	90% (89%)
Repair completion within SLA timescales	70% (67%)	75% (72%)	80% (77%)

Aim and effect of regulation

- 8.31 As set out in Section 3, one of the consequences of BT having SMP is that it may not provide the quality of service that customers require. In competitive markets, customers' ability to switch providers signals to providers to choose a cost-quality trade-off that will suit their customers. However, in the case of the wholesale fixed access markets, Openreach is unlikely to receive such signals, as customers generally cannot switch to alternative networks. Moreover, the lack of competitive pressure may result in Openreach having little incentive to innovate to find ways of improving quality of service. In addition, there is the potential for discrimination issues if Openreach were to provide BT divisions with better quality of service than it provides to other (non-BT Group) telecoms providers.
- 8.32 As set out in our March 2017 WLA Consultation, the negative effects on customers of inadequate quality of service delivered by Openreach include a greater number of faults, slow resolution of those faults, and frustration resulting from long delays to the installation of fixed broadband and voice services. Inadequate Openreach quality of service also has the potential to undermine the effective functioning of the network access remedy due to the negative impacts on retail competition by, among other things, affecting switching behaviour. For example, long or uncertain waiting times for a provision or repair may discourage switching with consequent implications for retail competition.
- 8.33 Quality standards apply to Openreach's performance at the aggregate level over a defined period with the aim of ensuring that quality is maintained at a sufficiently high level to prevent material detriment to competition and customers. Quality standards safeguard against the network access remedy from being undermined.
- 8.34 A further benefit of quality standards is that if they are set at a sufficiently demanding level they give telecoms providers certainty about the level of quality they can expect from Openreach. This contrasts with the SLA/SLG regime, which provides compensation if a specific installation or repair is not dealt with in a timely manner, but gives little assurance to telecoms providers over what will actually be achieved. We believe that certainty over the speed of repairs and installations plays an important role in the functioning of retail competition and contributes to the effectiveness of the network access remedy. It allows telecoms providers to plan their strategies for delivering retail services and differentiating their products effectively.

²⁰¹ Percentages reflect standards including and excluding fixed allowances for *force majeure* (i.e. Local MBORCs).

Our proposals

Quality standards for repairs

- 8.35 As set out in Section 5, in relation to on time repair at SMLs 1 and 2, we propose an increase in the current 80% standard to 93% over the review period.

Table 8.3: Quality standards for on time repairs (WLR, MPF, and GEA-FTTC)

QoS standard applicable to each of the ten geographic areas	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA timescales (Adjusted standard for <i>force majeure</i>)	80% (77%)	83% (80%)	90% (87%)	93% (90%)

- 8.36 In the case of SML1 and 2 repairs completed five working days beyond SLA, we propose setting a 97% standard in the final year of the control.

Table 8.4: Quality standards for repairs completed at +5 working days (WLR, MPF, and GEA-FTTC)

QoS standard applicable to UK as a whole	Current level	First year (2018/19)	Second year (2019/20)	Third year (2020/21)
Repair completion within SLA +5 days	N/A	95%	96%	97%

Application, compliance, and enforcement

- 8.37 As with the provision standards, compliance with the two repair standards described above will be assessed by measuring the combined performance of WLR, MPF, and GEA-FTTC.
- 8.38 Consistent with our decisions in the 2014 FAMR Statement, we intend to apply the proposed on time repair standards on a regional basis, taking account of MBORCs by way of specific allowances, and will assess BT's compliance on an annual basis.
- 8.39 With respect to the +5 days standards, we propose to apply these measures on a national basis taking account of 'High Level MBORCs' (e.g. extreme weather events) only, and will again assess BT's compliance annually.
- 8.40 We are also proposing that the repair QoS standards should come into force on 1 April 2018, at the end of the ongoing compliance year for the QoS requirements currently in force.²⁰²

²⁰² Per the 2016 Directions and Consents relating to the WLR and MPF minimum standards and KPIs, the current compliance period for the MPF and WLR Minimum Standards will end on 1 April 2018.

Quality standards for installations

8.41 As set out in Section 6, in relation to installation date certainty, we propose an increase in the current 90% standard to 95% over the market review period.

Table 8.5: Quality standards for installation date certainty (WLR, MPF, and GEA-FTTC)

	Current standard	Proposed new standards		
		Year 1 (2018/19)	Year 2 (2019/20)	Year 3 (2020/21)
% of installations to be completed by the committed date (Adjusted standard for <i>force majeure</i>)	90% (89%)	92% (91%)	92% (91%)	95% (94%)

8.42 In the case of installations requiring appointments for an engineer visits, we propose:

- a reduction in the lead times for the first available appointment date offered by Openreach from 12 working days to ten working days; and
- a requirement on Openreach to offer a ten-working day appointment date 90% of the time.

Table 8.6: Quality standards in relation to the FAD for installations requiring an engineer visit (WLR, MPF, and GEA-FTTC)

	Current standard	Proposed new standards		
		Year 1 (2018/19)	Year 2 (2019/20)	Year 3 (2020/21)
Working days within which first date offered for installation appointments	12	12	12	10
		Year 1 (2018/19)	Year 2 (2019/20)	Year 3 (2020/21)
Frequency with which regulated installation appointment date must be offered (Adjusted standard for <i>force majeure</i>)	80% (79%)	90% (89%)	90% (89%)	90% (89%)

Application, compliance, and enforcement

- 8.43 Compliance with the two provision standards described above will be assessed by measuring the combined performance of WLR, MPF, and GEA-FTTC services.
- 8.44 Consistent with our decisions in the 2014 FAMR Statement, we intend to apply the proposed installation standards on a regional basis, taking account of MBORCs by way of specific allowances, and will assess BT's compliance on an annual basis.
- 8.45 We are also proposing that the new QoS standards should come into force on 1 April 2018, at the end of the ongoing compliance year for the QoS requirements currently in force.²⁰³

Legal tests

- 8.46 Section 87(3) of the Act authorises the setting of SMP services conditions in relation to the provision of network access. Section 87(5) of the Act provides that such conditions may include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations contained in the conditions are complied with within the periods and at the times required by or under the conditions. In this regard, we note Article 12(1) of the Access Directive, which provides that national regulatory authorities may attach to conditions relating to network access obligations covering fairness, reasonableness and timeliness. We have set out in the 2016 NMR Consultation and March 2017 WLA Consultation why we consider the proposed SMP conditions regarding quality of service meet the relevant tests set out in the Act.
- 8.47 For the reasons set out below, we are satisfied that the proposed directions for quality of service standards made pursuant to the above proposed SMP conditions (as notified at Annex 8) meet the relevant tests set out in the Act.
- 8.48 We consider that the directions we are proposing to make meet our duties in the Act, including our general duties under section 3 and all the Community requirements set

²⁰³ According to the 2016 Directions and Consents relating to the WLR and MPF minimum standards and KPIs, the current compliance period for the MPF and WLR Minimum Standards will end on 1 April 2018.

out in section 4 of the Act. In particular, the proposed directions are aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that BT provides an improved level of performance in key areas of importance to its customers and to consumers.

8.49 We also consider that the proposed directions meet the criteria in section 49(2) of the Act. In particular, our proposals are:

- objectively justifiable, in that they aim to ensure that BT provides adequate levels of quality of service in relation to the installation and maintenance of the network access on which telecoms providers and their customers rely. For the reasons set out in this document, we consider that, to achieve this level of quality of service, it is necessary to continue imposing quality standards and to set these at the increased levels we are proposing;
- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of market power in the wholesale fixed access markets;
- proportionate, in that they are targeted specifically to those areas for which regulation is required. We consider that our proposals are a proportionate means of achieving the objective of ensuring an appropriate level of service in the delivery of key aspects of network access, taking into account BT's operational capabilities and potential costs to customers and telecoms providers. Further, the requirements that we are proposing are structured to take into account the impact of events outside BT's control on its ability to meet our proposed standards; and
- transparent, in that it is clear that the intention of the directions is to ensure that BT maintains an appropriate level of quality of service in relation to several key aspects of importance to telecoms providers that buy these wholesale inputs and to consumers. In addition, our proposed directions are clear in setting out the standards that we are proposing to impose.

8.50 For the reasons set out above, we consider that the proposed quality of service performance standards directions are appropriate to address the concerns we have identified and are in line with section 49(2) of the Act.

The BEREC common position

8.51 In making these proposals we have also taken utmost account of the BEREC common position.²⁰⁴ In relation to the objective of achieving a reasonable quality of access services (operational aspects), we note that the BEREC common position identifies, among other things, as best practice that national regulatory authorities (NRAs) should require SMP operators to provide a reasonable defined level of service (BP32) to address the concern that access services may not be of

²⁰⁴ BEREC, 2012. *BEREC common position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including share or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market*, BoR (12) 127, 8 December 2012, http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/comm_on_approaches_positions/1127-revised-berec-common-position-on-best-practice-in-remedies-on-the-market-for-wholesale-physical-network-infrastructure-access-including-shared-or-fully-unbundled-access-at-a-fixed-location-imposed-as-a-consequence-of-a-position-of-significant-market-power-in-the-relevant-market [accessed 24 March 2017].

reasonable quality and service levels may not be comparable with those provided by the SMP operators to their own downstream businesses.

Question 8.3: Do you agree with our proposals to direct BT to comply with performance standards regarding installations and repairs? Please provide reasons and evidence in support of your views.

Proposals regarding transparency as to quality of service

Current regulation

- 8.52 As set out in Section 2, in our 2014 FAMR we imposed several obligations on BT in relation to its transparency, which were subsequently amended by our 2016 Directions and Consents. Specifically, in our 2014 FAMR we imposed an SMP condition requiring BT to publish all such information as to the quality of service in relation to network access in such manner and form, and including such content, as we may from time to time direct.
- 8.53 Pursuant to this condition, we imposed two directions in the 2014 FAMR Statement, that were further amended by our 2016 Directions and Consents, requiring BT to publish specified KPIs for:
- VULA, MPF and Shared Access services; and
 - WLR services, wholesale ISDN30 exchange line services and wholesale ISDN2 exchange line services.
- 8.54 The specified KPIs are summarised in Section 7.

Aim and effect of the regulation

- 8.55 As set out in Section 3, BT, as a vertically integrated operator, has the ability and incentive to favour its own retail businesses by offering more favourable terms which would give it a competitive advantage over other telecoms providers and have a material adverse effect on competition. This discrimination could take the form of variations in quality of service.
- 8.56 Transparency measures, such as the obligation to disclose detailed KPIs, can help ensure that network access is provided on fair and reasonable terms by making it easier to identify such discrimination. The disclosure of detailed KPI data to Ofcom also allows us to monitor important aspects of Openreach's service closely and observe trends in performance over time. This means we can assess performance for the services and quality aspects that will be subject to the quality standards. We can also monitor performance for services and quality aspects outside the scope of the quality standards, encouraging Openreach to focus on delivering quality for quality a wide range of features (not only those covered by standards). This means we can detect potential concerns early and react quickly by, for example, using direction making powers to set additional regulation.

Our proposals

- 8.57 Below we set out our proposals to make directions pursuant to our proposed SMP conditions in the 2016 NMR Consultation and the March 2017 WLA Consultation, requiring BT to provide transparency as to its quality of service performance and to

publish certain KPIs and reports on late repairs and installations. Our proposed draft directions are set out at Annex 8.²⁰⁵

- 8.58 We have set out our detailed proposals for transparency as to quality of service in Section 7. In the light of the quality standards proposed in Sections 5 and 6 and the SMP conditions we have proposed to imposed on BT, we have outlined the KPIs we propose that BT should be required to provide to Ofcom and industry in relation to specified aspects of its service delivery. However, we have undertaken a review of the current set of KPIs to ensure that they remain fit for purpose in the light of our proposed QoS standards, the extension of regulation to GEA-FTTC, and the QoS concerns identified in this review. We have particularly considered which KPIs should be retained, revised, added, and/or removed. We consider that these new KPIs will allow us to continue effective monitoring of Openreach's provision and repair performance, and ensure that BT is not discriminating in its service performance between telecoms providers. A summary of the proposed KPIs is set out below:

²⁰⁵ In the 2016 NMR Consultation, we proposed to continue imposing KPIs for ISDN30 and ISDN2 markets in relation to repairs but to remove all existing KPIs relating to provisioning: Ofcom, 2016. Consultation. *Narrowband Market Review: Consultation on the proposed markets, market power determinations and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*, paragraphs 9.55 to 9.58, https://www.ofcom.org.uk/_data/assets/pdf_file/0016/95011/Narrowband-Market-Review.pdf.

Table 8.8: Proposed KPIs for MPF, GEA-FTTC, GEA-FTTP, SMPF, and WLR²⁰⁶

Grouping	KPI	SML	MPF	GEA-FTTC	GEA-FTTP	SMPF	WLR
KPIs relating to QoS standards	Appointment availability		Y P GM	Y P GM	Y	x	Y P GM
	Provisioning of all orders		Y P GM	Y P GM	Y	x	Y P GM
	Repair completion	1	Y P GM	Y P GM	x	x	Y P GM
		2	Y P GM	Y P GM	Y GM	Y GM	Y P GM
		3	Y GM	Y GM	Y GM	Y GM	Y GM
		4	Y GM	Y GM	Y GM	Y GM	Y GM
KPIs to monitor quality more broadly	Average first available appointment date		Y P	Y P	Y	x	Y P
	Percentage of orders rejected		Y	Y	Y	x	Y
	Provisioning of appointed orders		Y	Y	Y	x	Y
	Average installation time		Y P	Y P	Y	x	Y P
	Percentage of installations affected by MBORC declarations that missed the Committed Date		Y	Y	Y	x	Y
	Percentage of orders reported as faulty		Y	Y	Y	x	Y
	Average time to restore service	1	Y P	Y P	x	x	Y P
		2	Y P	Y P	Y	Y	Y P
		3	Y	Y	Y	Y	Y
		4	Y	Y	Y	Y	Y
	Percentage of repairs affected by MBORC declarations that missed the SLA		Y	Y	Y	x	Y
	Average time to restore service for repairs that have exceeded the SLA by more than 20 working days	1	Y	Y	x	x	Y
		2	Y	Y	Y	Y	Y
		3	Y	Y	Y	Y	Y
		4	Y	Y	Y	Y	Y
	Percentage of repeat faults		Y	Y	Y	Y	Y
	Percentage of installed base reported as faulty		Y	Y	Y	Y	Y
	Percentage of missed installation appointments		Y P			x	Y P
	Percentage of missed repair appointments		Y P				Y P

²⁰⁶ 'Y' means that BT would be required to provide this information to Ofcom and industry. The precise information that must be provided to industry may differ against that provided to Ofcom although, for reasons of clarity, we have not sought to represent these differences within this table. 'P' means that BT would be required to publish this information on its website every three months, commencing 20 October 2014 (in addition to providing this information to industry and Ofcom). 'GM' means that the data BT provided must be disaggregated between each GM region and Northern Ireland. Where the 'GM' marking is not used, BT would only be required to publish KPIs in relation to the United Kingdom as a whole. 'x' means that BT would not be required to provide any information in relation to this KPI.

- 8.59 Further, we have set out proposals to require BT to provide a monthly report on service failures that fall outside our proposed regulations. Our proposals particularly seek to provide greater transparency around the reasons why Openreach fails to complete some repairs and installations after a period of months. This will allow us to identify any potential areas of concern.

Application, compliance, and enforcement

- 8.60 As set out in Section 7, we are not proposing any substantive changes to these aspects of the existing requirements for KPIs. In summary, BT must provide KPIs monthly with a subset to published quarterly on its website.

Legal tests

- 8.61 We have set out in the 2016 NMR Consultation and March 2017 WLA Consultation why we consider the proposed SMP services condition regarding quality of service meets the relevant tests set out in the Act.
- 8.62 For the reasons set out below, we are satisfied that the proposed directions made pursuant to the above proposed SMP services conditions (as notified at Annex 8) meet the relevant tests set out in the Act.
- 8.63 We consider that the proposed directions we are making in the wholesale fixed access markets meet our duties under section 3, as well as all the Community requirements set out in section 4 of the Act. The proposed directions are aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that telecoms providers have visibility of the quality of service that BT provides to itself and to other providers. Furthermore, they provide visibility to consumers about BT's performance in the provision and maintenance of wholesale access services upon which they (and their retail telecoms providers) in many cases rely.
- 8.64 We also consider that the proposed directions meet the criteria in section 49(2) of the Act. We consider that the proposed KPI Directions are:
- objectively justifiable, in that we have identified a need for transparency to ensure appropriate monitoring of BT's performance in relation to installations and repairs and to identify any concerning trends in relation to such performance, including any potential discrimination in the provision of network access (and to provide transparency to industry and consumers on such matters);
 - not unduly discriminatory, as they are proposed only for BT, and no other operator has been provisionally found to hold a position of SMP in the wholesale fixed access markets;
 - proportionate, because they only require BT to publish the minimum information we consider is required to effectively monitor BT's quality of service performance and its compliance with the remedies we are proposing to impose in relation to the provision of network access, its quality of service performance and non-discrimination. The KPI requirements we are proposing to impose have been largely based on the existing requirements and, where we have made changes and additions, this has been done only to the extent necessary to address new concerns, particularly with regards to compliance with the new QoS standards we are proposing to impose; and

- transparent, in that they are clear in their intention to ensure an appropriate level of transparency and in the obligations they are proposing to impose on BT.

8.65 For the reasons set out above, we consider that the proposed KPI Directions are appropriate to address the concerns we have identified and are in line with section 49(2) of the Act.

The European Commission (EC) recommendation

8.66 We have taken utmost account of the Costing and Non-discrimination Recommendation.²⁰⁷ The Costing and Non-discrimination Recommendation states that, when imposing a non-discrimination obligation under Article 10 of the Access Directive, NRAs should impose on the SMP operator the use of KPIs to monitor effectively compliance with non-discrimination obligations. It indicates that such KPIs should:

- measure performance at least in relation to the following key elements of the provision of regulated wholesale services: (a) ordering process; (b) provision of service; (c) quality of service, including faults; (d) fault repair times; and (e) migration between different regulated wholesale inputs (excluding on-off bulk migrations); and
- allow for comparison of services provided internally and externally by the SMP provider.

8.67 Moreover, the Costing and Non-discrimination Recommendation provides that NRAs should:

- take account of existing performance measures in imposing KPIs;
- ensure that KPIs are published in a manner that allows for early discovery of potential discriminatory behaviour (the Costing and Non-discrimination Recommendation recommends at least quarterly publication on the NRA's website or on the website of an independent third party designated by the NRA);
- ensure that the KPIs are regularly audited by the NRA or, alternatively, by an independent auditor; and
- where the results of the KPIs indicate that the SMP operator may not comply with its non-discrimination obligation, intervene by investigating the matter in more detail and, where necessary, enforce compliance.

8.68 We consider that our conditions are consistent with these principles. KPIs will continue to be either openly published or available to industry for review. They cover all the key elements of service provision and allow for comparison between internal and external customers. They take account of existing performance measures, and we have indicated a willingness to intervene if necessary if KPIs indicate a problem. We maintain an active programme of monitoring KPIs. We continue to consider that

²⁰⁷ EC, 2013. *Commission recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*, 11 September 2013. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF>.

formalised regular audits of KPIs imposed under the SMP framework would be disproportionate, although this is something which we keep under review.

- 8.69 Mandatory KPIs of BT's main EOI services comparing performance to telecoms providers within BT to that for non-BT telecoms providers (and which are subject to audit checks) also form part the equivalence regime established by BT's Undertakings.²⁰⁸

The BEREC common position

- 8.70 In forming these proposals, we have also taken utmost account of the BEREC common position, particularly BP27 and BP34 in relation to the objectives of achieving transparency and a reasonable quality of access services.²⁰⁹ We consider that our proposals are consistent with the best practice set out in the BEREC common position.

Question 8.4: Do you agree with our proposals to direct BT to provide the KPIs we have specified? Please provide reasons and evidence in support of your views.

Proposals for the regulation of SLAs and SLGs

Current regulation

- 8.71 In the 2014 FAMR Statement, we imposed a new regulatory requirement on BT to include specified SLAs and SLGs linked to specific services in its Reference Offers. This requirement applied to WLR, local loop unbundling (LLU), GEA, wholesale ISDN30 line rental and wholesale ISDN2 line rental services. We considered that this was necessary to make it clear for which forms of network access BT was required to include a minimum set of specified SLAs and SLGs within its Reference Offer.
- 8.72 We considered that the 2008 SLG Statement remained appropriate and therefore, decided that the 2008 SLG directions for WLR and LLU should continue to apply (until otherwise modified or withdrawn).

²⁰⁸ These BT Undertakings KPIs are published by BT at <http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Ourundertakings/KeyPerformanceIndicators/index.htm> and are reported on in the Equality of Access Board's annual reports (see <http://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/EqualityofAccessBoard/EqualityofAccessBoard.htm>) [accessed 24 March 2017].

²⁰⁹ BEREC, 2012. *BEREC common position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market*, BoR (12) 127, 8 December 2012, http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/common_approaches_positions/1127-revised-berec-common-position-on-best-practice-in-remedies-on-the-market-for-wholesale-physical-network-infrastructure-access-including-shared-or-fully-unbundled-access-at-a-fixed-location-imposed-as-a-consequence-of-a-position-of-significant-market-power-in-the-relevant-market [accessed 24 March 2017].

Our proposals not to re-impose the 2008 SLG directions

Proposals in the current review of WLA markets

- 8.73 In our March 2017 WLA Consultation, we have set out our proposals and reasoning not to re-impose the 2008 SLG directions.²¹⁰ Rather than relying on the 2008 SLG directions as the source of regulatory obligations on BT, we consider that it is now more appropriate to include certain key elements of those directions in BT's SMP Reference Offer condition. The aim and effect of our proposal is to retain the same regulatory requirements regarding SLAs and SLGs as was provided for in the 2014 FAMR Statement through the imposition of previous Reference Offer obligations and the application of the 2008 SLG directions, but extended to VULA.²¹¹

Proposals to ensure consistency in the current review of Narrowband markets

- 8.74 In our 2016 NMR Consultation, we set out our proposal for the 2008 SLG directions to continue to apply for WFAEL (until otherwise modified or withdrawn). We notified our proposal to do so in paragraph 1A.6 (WFAEL) of Condition 1A – Network access at Annex 6 of the 2016 NMR Consultation.²¹² To ensure consistency with our proposals in the March 2017 WLA Consultation, we are now proposing to remove that provision.
- 8.75 As we set out in the March 2017 WLA Consultation, we do however consider that the reasons, set out in the 2008 SLG directions (as to why BT's contracts for the supply of certain regulated wholesale network access services must provide for proactive compensation payments to telecoms providers and include service level commitments with service level guarantees for the availability of Openreach's equivalence management platform (EMP) gateway), endure.
- 8.76 We consider that the relevant Reference Offer SMP conditions in our current reviews of the wholesale fixed access markets should also include, in respect of WFAEL, wholesale ISDN30, wholesale ISDN2, MPF and VULA, specific service level commitments on the availability of the relevant operational support systems (by which requests for service provision, transfers and fault repair as applicable are made) and that SLG payments are made on a proactive basis by BT.
- 8.77 Consistent with our proposals in the March 2017 WLA Consultation, we have therefore notified at Annex 8 a legal condition to reflect the relevant parts of our

²¹⁰ Ofcom, 2017. *Wholesale Local Access Market Review – Volume 1: Consultation on the proposed market, market power determinations and remedies*, paragraphs 5.108-116, <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>.

²¹¹ We consider that our proposals to extend SLA/SLG requirements to VULA make no material change to the status quo as SLAs and service credits for EMP are provided for in BT's current contract for GEA.

²¹² Ofcom, 2016. *Narrowband Market Review – Annexes: Consultation on the proposed markets, market power determinations and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*, Annex 6, Draft legal instruments, Proposals for SMP services conditions, Part 3: Conditions (BT), P36, Consultation, 1 December 2016, https://www.ofcom.org.uk/_data/assets/pdf_file/0022/95035/NMR-annexes.pdf.

further proposals in relation to Condition 6 – Publication of a Reference Offer as notified in the 2016 NMR Consultation²¹³ to:

- add “(”) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made as applicable” to paragraphs 6.2A (WFAEL), 6.2B1 (ISDN30), 6.2B2 (ISDN30), 6.2C1 (ISDN2) and 6.2C2 (ISDN2); and
- change the definition at paragraph 6.11(b) to “Service Level Guarantees” means a commitment specifying the amount payable *proactively* by the Dominant Provider to a Third Party for a failure to adhere to a Service Level Commitment.²¹⁴

8.78 We do not consider that our above further proposals with regard to the proposed Reference Offer SMP services condition materially change our reasoning and assessment of the legal tests set out in the 2016 NMR Consultation.²¹⁵

Proposed new SLG direction on removing limitations on compensation for late repair and late installations

Current regulation

8.79 The 2008 SLG directions for WLR and LLU²¹⁶ required BT to modify the terms and conditions of its relevant contracts relating to SLGs. The modification allowed BT to cap the number of days for which compensation would be payable under the SLGs at 60 full days compensation per line for any one failure to meet the relevant SLAs.

Our proposals

8.80 In the 2016 NMR Consultation and the March 2017 WLA Consultation, we have proposed to impose SMP obligations requiring BT to provide network access upon reasonable request. We have also proposed to require BT to comply with Ofcom's directions in relation to the provision of network access.²¹⁷ We are proposing to make a direction under these proposed SMP conditions. Particularly, for the reasons set out in Sections 3, 5 and 6, we propose requiring BT to amend its terms and conditions in its relevant contracts for the supply of WLR, MPF and FTTC services to

²¹³ Ofcom, 2016. *Narrowband Market Review – Annexes: Consultation on the proposed markets, market power determinations and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*, Annex 6, Draft legal instruments, Proposals for SMP services conditions, Part 3: Conditions (BT), Pp 64-66, Consultation, 1 December 2016, https://www.ofcom.org.uk/data/assets/pdf_file/0022/95035/NMR-annexes.pdf.

²¹⁴ In making these proposed amendments, we have also corrected two omissions. Firstly, in paragraphs 6.2B2 and 6.2C2, the list of service level commitments should have been preceded with “(a) Service Level Commitments in respect of at least the following aspects of that service:” Secondly, in 6.2B1 the service level commitment “Availability of an appointment for the provision of the service;” should have been included.

²¹⁵ Ofcom, 2016. *Narrowband market review - consultation on the proposed markets, market power determinations and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*, Pp 154-157, Consultation, 1 December 2016, https://www.ofcom.org.uk/data/assets/pdf_file/0016/95011/Narrowband-Market-Review.pdf.

²¹⁶ Ofcom. 2008. *Statement and Directions. Service level guarantees: incentivising performance*. Annex 1 (Direction: WLR) and Annex 2 (Direction: LLU). https://www.ofcom.org.uk/data/assets/pdf_file/0020/33617/statement.pdf.

²¹⁷ See Condition 1A.2A(b)(ii) at Annex 6 of the 2016 Narrowband Consultation and Condition 1.5 at Annex 9 of the March 2017 WLA Consultation.

remove the caps on compensation for late repairs and late installations. Our proposed draft Directions are set out at Annex 8.

Legal tests

- 8.81 We are satisfied that the proposed SLG directions notified at Annex 8 meet the relevant tests set out in the Act.
- 8.82 First, we have considered our duties under section 3 and all the Community requirements set out in section 4 of the Act. The conditions are particularly aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by the implementation of an SLG regime that will incentivise BT to provide good quality of service to telecoms providers.
- 8.83 Second, section 49 of the Act requires directions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed directions are:
- objectively justifiable, in that they are necessary to further incentivise BT to provide improved quality of service to telecoms providers and to ensure that SLG payments remain effective while orders for repairs and installation remain incomplete;
 - not unduly discriminatory, as they are imposed only on BT, and no other operator has been provisionally found to hold a position of SMP in the wholesale fixed access markets;
 - proportionate, in that they ensure that appropriate compensation is paid in such a way as to incentivise BT's performance in completing repair and installation orders without exposing BT to excessively high levels of financial liability; and
 - transparent, in that the directions are clear in what they are intended to achieve and in the obligations they impose on BT.

The EC recommendation

- 8.84 We have taken utmost account of the Costing and Non-discrimination Recommendation.²¹⁸ In relation to our proposal, the Costing and Non-discrimination Recommendation recommends that NRAs should require SMP operators to implement SLAs alongside KPIs, which should include SLGs in the case of a breach of the SLA. We consider that the approach we have adopted is consistent with this recommendation.

The BEREC common position

- 8.85 In forming our proposal, we have also taken utmost account of the BEREC common position, particularly BP33 in relation to the objective of achieving a reasonable

²¹⁸ EC, 2013. *Commission recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*, 11 September 2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF> [accessed 24 March 2017].

quality of access services.²¹⁹ We therefore consider that our proposals are consistent with the best practice set out in the BEREC common position.

Question 8.5: Do you agree with our proposals concerning the regulatory obligations for SLAs and SLGs? Please provide reasons and evidence in support of your views.

Proposals for SLA and SLG negotiations

Introduction

- 8.86 In our 2014 FAMR Statement and 2016 BCMR Statement, we adopted (after consultation with stakeholders) contract negotiation principles and SLA/SLG assessment criteria to be applied to future industry negotiations in relation to SLAs/SLGs. These formed part of the package of measures we put in place to ensure that Openreach is responsive to its customers' requirements to provide improved quality of service in the supply of wholesale network access services (provided pursuant to our WLR, LLU and wholesale Ethernet leased line SMP remedies).
- 8.87 Regarding our current review of WFAEL, wholesale ISDN30, wholesale ISDN2 and WLA markets, we believe that the same principles and criteria should remain applicable to any future contract negotiations between Openreach and its customers in relation to SLAs/SLGs relating to the supply of WLR and LLU services but should also be extended to SLA/SLG negotiations relating to the supply of VULA services. We note that Openreach and telecoms providers appear, in any event, to have adopted our principles and criteria for contract negotiations, in agreeing SLAs/SLGs for GEA services.
- 8.88 In this sub-section, we:
- reprise the reasoning for adopting contract negotiation principles and SLA/SLG assessment criteria in our previous reviews;
 - specify the relevant principles and criteria and related matters, which we are proposing should apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the supply of WLR, LLU and VULA services; and
 - set out why we consider that it is appropriate to adopt these principles and criteria as part of the package of remedies, which we are proposing to address our quality of service concerns in our current reviews of narrowband and wholesale local access markets.

²¹⁹ BEREC, 2012. *BEREC common position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market*, BoR (12) 127, 8 December 2012, http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/comm_on_approaches_positions/1127-revised-berec-common-position-on-best-practice-in-remedies-on-the-market-for-wholesale-physical-network-infrastructure-access-including-shared-or-fully-unbundled-access-at-a-fixed-location-imposed-as-a-consequence-of-a-position-of-significant-market-power-in-the-relevant-market [accessed 24 March 2017].

Reasoning for the adoption of contract negotiation principles and SLA/SLG assessment criteria in our previous reviews

- 8.89 In response to concerns raised by telecoms providers about the process for industry negotiations when BT or telecoms providers consider that existing terms should be changed or that BT should provide new SLAs/SLGs for an element of a service, we recognised that BT, as the SMP provider, naturally holds a more powerful negotiating position than other telecoms providers.
- 8.90 We stated our view that, where all parties are negotiating from a broadly similar position of market power, commercial negotiation without the involvement of the industry regulator is the preferred method for reaching agreement on the terms of SLAs and SLGs.
- 8.91 In recognition of, in particular, the likely imbalance in negotiating positions as between BT's Openreach division and its customers, we explained that we had concerns about the predictability and visibility of the process that determines critical aspects of SLA/SLG terms and conditions.
- 8.92 While maintaining that regulatory intervention should be the last resort, we considered that there should be a defined, structured and open process for the negotiation of SLA/SLG terms and conditions which reserved a central role for the OTA2 and set a time limit for negotiations.

Proposed principles for the contract negotiation process and criteria for the assessment of SLA/SLG requests in relation to the supply of WLR, LLU and VULA services

- 8.93 We propose that the principles set out in Table 8.9 and the criteria set out in Table 8.10 should apply to future contract negotiations between Openreach and its customers in relation to SLAs and SLGs for the supply of WLR²²⁰, LLU and VULA services.
- 8.94 These principles and criteria are the same as those set out in the 2014 FAMR Statement and which were amended following consultation with stakeholders in reaching our final decisions and were replicated in the May 2015 BCMR Consultation and subsequent 2016 BCMR Statement.

²²⁰ Including wholesale ISDN2 and wholesale ISDN30.

Table 8.9: Proposed principles for the contract negotiation process

Principles	
Principle 1	The OTA2 should facilitate all negotiations to create or change an SLA/SLG and that this negotiation will allow input from all affected parties.
Principle 2	The OTA2 will, using stated criteria, assess whether a request for negotiations on a new SLA/SLG or change to an existing SLA/SLG (and related contract terms) should be facilitated through this negotiation process.
Principle 3	No negotiations over the content of an SLA/SLG should extend beyond 6 months, with regular reporting to Ofcom. If, in the opinion of the OTA2, negotiations cannot be successfully concluded or have not been concluded within 6 months, then the OTA2, as part of its final report to Ofcom, will set out its view on whether and on what basis Ofcom should initiate a review.
Principle 4	Provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed.

Principles 1 and 2 – The role of the OTA2 and practical application

- 8.95 We envisage that the OTA2's role will be to facilitate the negotiation process, rather than make decisions. However, we consider that there is significant scope for the OTA2 to contribute to, as well as guide and structure, the negotiation process and to assist in ensuring that parties can fully participate.
- 8.96 We would expect that the OTA2 would also have a key role in prioritising the issues to be considered in the process. This could mean that the OTA2 would decide that an issue is not appropriate for consideration in the process. This would not, of course, prevent any stakeholder from raising this issue as a dispute directly with Ofcom, but would ensure that what would be a resource-intensive process is used effectively.
- 8.97 We propose that the initial criteria used by the OTA2 for making its assessment of SLA/SLG requests under Principle 2 are those set out in Table 8.10 below. While these criteria may need to be adapted over time, we propose that they form a reasonable basis for decisions as to prioritising issues for review.
- 8.98 The criteria below are referenced in our proposed principles.

Table 8.10: Criteria for the assessment of SLA/SLG requests

Detail	
Criterion 1	The request does not duplicate an existing request that is either being considered by the OTA2 or is under discussion within an existing industry forum.
Criterion 2	The request could provide an adequate material benefit for the telecoms provider or industry and that any negative impact of the request not being addressed cannot be easily mitigated without the reasonable support of Openreach.
Criterion 3	The request does not seek to address a telecoms provider deficiency that should more appropriately be addressed by the telecoms provider(s) themselves.
Criterion 4	The request has adequate scale and support across industry or from those telecoms providers addressing a recognised end customer group to which the request relates.

Principle 3 – Time limits for negotiation and clarifying/amending the subsequent process

- 8.99 We propose that six months is an appropriate period in which to allow negotiations to take their course, where it is clear they are progressing. However, where negotiations have clearly broken down, then the OTA2 need not wait for the full six-month period to elapse before providing its report to Ofcom.
- 8.100 Principle 3 provides that: (i) the OTA2 will be actively reporting to Ofcom on the progress of negotiations, including setting out its view on whether and on what basis Ofcom should initiate a review; and (ii) after receiving this report, we will consider the matter on its merits. We cannot commit (in the principles) to a full investigation or to invite parties to raise disputes without considering the facts of each specific case first. While we will need to take an independent view of the issues, we will take appropriate account of the OTA2's report, which we expect will include details about the contribution of all participants, including their role in any delays to negotiations.

Principle 4 – Clarifying the date when new SLAs/SLGs take effect

- 8.101 We consider that the 'backdating' of SLAs/SLGs may risk distorting any negotiation process. It could lead to a disproportionate focus on performance in that period and may act to discourage Openreach from engaging positively with the proposed changes, as Openreach would not have an opportunity to modify its behaviour in response to the new targets and any compensation payments. We also consider that our principle that 'provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed' provides sufficient clarity as to the time at which the new SLA/SLG would take effect, i.e. on its agreement.

Proposals regarding negotiating behaviours and references to Ofcom under the proposed principles

- 8.102 We would expect all parties to any such negotiations (including Openreach) to make all reasonable efforts to exhibit the following behaviours:

- to approach negotiation of these matters with professional courtesy and an openness and willingness to consider the issues raised and any evidence presented;
- to be responsive to requests for negotiation and dialogue in a timely manner;
- to ensure that suitably empowered staff are available for meetings within a reasonable period following a request; and
- to ensure that requests for information are responded to as quickly as reasonably possible.

8.103 If Openreach does not engage in a manner we consider appropriate, then we may consider whether there is a need for additional regulatory conditions (to be imposed either as part of future market reviews or at another time) which impose a process for negotiation in such circumstances.

8.104 If an issue is referred to us under these proposed arrangements, we will need to consider what is appropriate, including whether an issue/range of issues warrants our intervention. In addition to considering any such issues under our dispute resolution powers,²²¹ it may also be necessary to consider whether a broader intervention might be required through, for instance, an own initiative compliance investigation or a policy review. Any decision about intervention will be based on our assessment of the issues referred to us in the light of our duties and the broader regulatory framework. In the context of any such considerations, we would also consider any advice that the OTA2 offers in its final report, as appropriate.

8.105 In relation to the proposed arrangements, where an issue is referred to us and we consider that it is appropriate to intervene, our starting point will be the respective proposals of each of the parties. In the first instance, we would expect to consider whether it would be appropriate, in the light of our duties and the broader regulatory framework, to choose between these proposals, rather than seek to consider other alternative options in detail. This would be intended to create the incentive for parties to set out their most reasonable final positions, rather than taking an extreme position in order to try to distort any eventual regulatory outcome in their favour. However, such an approach remains subject to the overall requirement to adopt an outcome which overall best meets our statutory duties.

Reasoning for the adoption of contract negotiation principles and SLA/SLG assessment criteria in these current reviews

8.106 We consider that the rationale for adopting principles for contract negotiation in previous reviews is likely to be applicable over the period of our current market reviews. Faced with the prospect of negotiating contractual terms and SLAs/SLGs to be applied (e.g. to take account of our proposals to require retail providers to provide automatic compensation to customers for a range of quality of service issues associated with fixed line services (such as delayed repairs)), including those supplied to retail providers by Openreach at the wholesale level, a similar imbalance in negotiating positions as between Openreach and its customers is likely to arise. Our findings in 2016 NMR and March 2017 WLA Consultations have provisionally concluded that BT has SMP in the wholesale fixed access markets set out in

²²¹ Ofcom, June 2011. *Dispute Resolution Guidelines*.
https://www.ofcom.org.uk/_data/assets/pdf_file/0020/71624/guidelines.pdf.

Section 2 and, therefore, that telecoms providers will continue to be reliant on Openreach for the supply of services such as WLR, MPF and GEA.

- 8.107 Furthermore, we believe that the application of the above principles and criteria has, thus far, worked well particularly in relation to the supply of WLR, MPF and GEA services. However, we would welcome further comments from relevant stakeholders on this point in their responses to this consultation and the specific question below.

Question 8.6: Do you agree with our proposals regarding the conduct of, and principles and criteria to be applied to, contractual negotiations concerning SLAs/SLGs? Please provide reasons and evidence in support of your views.

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 9 June 2017**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at <https://www.ofcom.org.uk/consultations-and-statements/category-1/quality-of-service/>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email QoS2017@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted to the address below, marked with the title of the consultation.
- QoS team
Floor 4
Ofcom, Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

- A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response please contact:
- Ali-Abbas Ali at ali-abbas.ali@ofcom.org.uk or on 020 7783 4090.

Confidentiality

- A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether

all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/terms-of-use/>.

Next steps

- A1.11 Following the end of the consultation period, Ofcom intends to publish a statement in early 2018.
- A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: <http://www.ofcom.org.uk/email-updates/>.

Ofcom's consultation processes

- A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Steve Gettings, Secretary to the Corporation, who is Ofcom's consultation champion:

Steve Gettings
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7783 4652

Email Steve.Gettings@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to ten weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email or post you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at <http://stakeholders.ofcom.org.uk/consultations/consultation-response-coversheet/>.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

☐

Name/contact details/job title

☐

Whole response

☐

Organisation

☐

Part of the response

☐

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

☐

Name

Signed (if hard copy)

Annex 4

Consultation questions

Question 3.1: Do you agree with our proposals regarding our approach to quality of service remedies. Please provide reasons and evidence in support of your views.

Question 4.1: Do you agree with our proposal to incorporate the anticipated lower fault rate in the charge control, and not to allow a specific adjustment for the related capex? Please provide reasons and evidence in support of your views.

Question 4.2: In Annex 5 we have set out our forecast for fault rates. Do you agree with our forecast? Please provide reasons and evidence in support of your views.

Question 4.3: Do you agree with our assessment of the role better diagnostics could play in improving fault resolution for both telecoms providers and customers, and how should these improvements be realised? Please provide reasons and evidence in support of your views.

Question 5.1: Do you agree with our proposals to set standards on repairs delivered to SMLs 1 and 2 timescales? Do you agree with our proposal to set new standards for repairs completed five working days over SLA for SMLs 1 and 2? Please provide reasons and evidence in support of your views.

Question 5.2: Do you agree with our proposed structure for the QoS standards? Please provide reasons and evidence in support of your views.

Question 5.3: Do you agree with the proposed levels of the repair standards? Please provide reasons and evidence in support of your views.

Question 5.4: Do you agree with our proposed glidepaths? Please provide reasons and evidence in support of your views.

Question 5.5: Do you agree with our proposed compliance periods and geographic applications of the repair standards? Please provide reasons and evidence in support of your views.

Question 5.6: Do you agree with our proposal to continue to make an allowance for force majeure in the repair QoS standards? Do you agree with our proposals to use 3% as the Local MBORC allowance and to retain exemptions for High Level events? Please provide reasons and evidence in support of your views.

Question 5.7: Do you agree with our proposal to make the payment period for late repair SLGs indefinite? Please provide reasons and evidence in support of your views.

Question 5.8: Do you have any further comments on our proposals for regulating BT's service performance for repairs? Please provide reasons and evidence in support of your views.

Question 6.1: Do you agree with our proposals for on-time installation standards? Please provide reasons and evidence in support of your views.

Question 6.2: Do you agree with our proposals for new timely appointment availability standards? Please provide reasons and evidence in support of your views.

Question 6.3: Do you agree with our proposals regarding compliance? Please provide reasons and evidence in support of your views.

Question 6.4: Do you agree with our proposals to minimise installation delays and improve the customer experience? Please provide reasons and evidence in support of your views.

Question 6.5: Do you agree with our proposals newly installed lines not working? Please provide reasons and evidence in support of your views.

Question 6.6: Do you have any further comments on our proposals for regulating BT's service performance for installations? Please provide reasons and evidence in support of your views.

Question 7.1: Do you agree with our proposals relating to the KPI reporting obligations set out above? Please provide reasons and evidence in support of your views.

Question 7.2: Do you agree with our proposal to require BT to submit a quarterly report on late repairs and installations, and the reasons for their delay? Please provide reasons and evidence in support of your views.

Question 7.3: Do you have any further comments on our proposals for transparency around Openreach's service performance? Please provide reasons and evidence in support of your views.

Question 8.1: Do you agree with the combination of proposals we have made regarding quality of service for repair and installation and regarding faults? Please provide reasons and evidence in support of your views.

Question 8.2: In Annex 7 we set out our analysis and estimates of the resource implications of quality standards, including the assumptions and results of the Resource Performance Model that we commissioned consultants to develop. Please state whether you agree with our approach and estimates as set out in Annex 7. Please provide reasons and evidence in support of your views.

Question 8.3: Do you agree with our proposals to direct BT to comply with performance standards regarding installations and repairs? Please provide reasons and evidence in support of your views.

Question 8.4: Do you agree with our proposals to direct BT to provide the KPIs we have specified? Please provide reasons and evidence in support of your views.

Question 8.5: Do you agree with our proposals concerning the regulatory obligations for SLAs and SLGs? Please provide reasons and evidence in support of your views.

Question 8.6: Do you agree with our proposals regarding the conduct of, and principles and criteria to be applied to, contractual negotiations concerning SLAs/SLGs? Please provide reasons and evidence in support of your views.

Annex 5

Forecast fault rates

Introduction

- A5.1 As stated in Section 4, fault rates contribute to the overall customer experience. A high rate of faults has the potential to lead to material customer detriment. Faults also give rise to increased network maintenance costs because, when faults occur, Openreach must expend engineering resources to resolve them. When setting regulated charges, as we propose to do for MPF Service Maintenance Level 1 (SML1) and GEA 40/10 services, an important consideration is the forecast rate of faults for the review period.
- A5.2 In this annex, we consider in detail the fault rates for Openreach services used to provide voice and broadband to develop a forecast for our proposed charge controls (as set out in the March 2017 WLA Consultation Annexes 11 and 12). Our proposals for improving on-time repairs when a fault does occur are set out in Section 5.
- A5.3 We begin by identifying the fault rates for WLR and for WLA services (MPF, SMPF and GEA-FTTC).²²²
- A5.4 We then look at fault trends and forecast fault rates over the period of the review. We are aware of an investment plan from Openreach targeting a reduction in faults, and we consider this in determining our forecast of fault rates. These forecast fault rates are used as inputs to our cost modelling.

Summary of Proposals

- A5.5 As in the 2014 FAMR, we propose to assess the fault rate of overlay services as the difference between the combined service fault rate (e.g. for WLR+SMPF) and the bearer service on its own (WLR), i.e. the fault rate for SMPF is WLR+SMPF fault rate minus the WLR fault rate.
- A5.6 To assess the trends in fault rates in more detail, we propose to split the faults into those related to the performance of services immediately after installation and those related to in-life performance. This allows us greater insight into the fault performance of GEA-FTTC where the volumes are growing rapidly.
- A5.7 We find that the WLR and MPF fault rates have not changed significantly in recent years, and that, without any change in approach to network reliability by Openreach, we would expect them to remain flat.
- A5.8 We find that the fault rates for GEA-FTTC provided over both WLR and MPF are falling, albeit from a high base.

²²² Certain costs are common between MPF and SMPF (which are services in the WLA market) and WLR (which is in the Wholesale Fixed Analogue Exchange Lines market). To enable us to allocate these costs correctly, we need to forecast WLR and SMPF fault rates, even though we only propose to charge control MPF SML1 and GEA 40/10 services. In addition, GEA services may be provided over either MPF or WLR bearer services, and may exhibit differing fault rates.

Fault Rate Forecasting

Our proposed methodology allows for the difference in the growth rates of services, and their technical characteristics

A5.9 To derive the fault rates applicable to repair, we obtained and analysed an extended version of the Openreach database of fault repairs, including line biography, that we first collected and analysed as part of the FAMR 2014.²²³ The data we obtained for this review covers the period April 2011 to March 2016. The faults included in Openreach's database are identified by what Openreach terms repair clear code. In making our assessment, we have only included the clear codes we consider relevant for the purposes of our proposed charge control as shown below in Table A5.1.²²⁴

Table A5.1: Fault repairs identified by clear code included in charge control fault rates

High-Level Clear Code	Description
4	Main Distribution Frame
5	Exchange Equipment
7	Customer Apparatus and Line
20	OCR ²²⁵ Fibre
21	VDSL ²²⁶ Cable Harness
22	DSLAM ²²⁷ mains power repair
23	FTTC proactive repair (FTTC Cabinet)
24	FTTC proactive repair
51	Fault Not Found (FNF) Local Line
60	Internal Cabling and Accessories
81	Underground (Exchange side)
82	Underground (Distribution side)
83	Fibre and Radio in the Access Network

A5.10 In the 2014 FAMR, we concluded that the fault rates for individual services could not be derived accurately from the fault records created by Openreach when the fault was reported. Where services are provided in combination, e.g. WLR+SMPF,

²²³ The line biography is a record for each line over time that identifies which products were using the copper line during which period.

²²⁴ We have not included clear codes 152 and 172. Clear code 152 means right when tested (Excluding Public / Managed Payphone) visited by field staff, as these costs should be recovered through Time Related Charges. Clear Code 172 means right when tested (Excluding Public / Managed Payphone) not visited, which should not result in field engineering costs.

²²⁵ OCR stands for Optical Consolidation Rack.

²²⁶ VDSL stands for Very-high-bit-rate Digital Subscriber Line.

²²⁷ DSLAM stands for Digital Subscriber Line Access Multiplexer.

the fault may be inaccurately allocated to either service. Consequently, we have followed the same approach that we used in the 2014 FAMR, which is to assume the difference in fault rates (between combined services and standalone services) gives the fault rate for the overlay service (i.e. WLR + SMPF minus WLR gives SMPF).

- A5.11 We derived fault rates for the various service combinations using a database of fault records that identify the copper lines on which the faults occur and a Copper Line Biography database that identifies which services were using the line at the time the fault occurred.²²⁸ These are set out in table A5.2.

Table A5.2: Base year (2015/16) fault rates (combined products)

Combined Products	Percentage lines faulty per year	Faults per 1000 lines per annum
WLR	8.3%	83
MPF	11.2%	112
WLR+SMPF	12.0%	120
WLR+GEA-FTTC	13.4%	134
MPF+GEA-FTTC	15.6%	156

Source: Ofcom analysis of Openreach data

- A5.12 We then derived fault rates by subtracting the WLR and MPF only fault rates from the combined services to obtain faults rates for SMPF and GEA-FTTC services. The individual fault rates for the base year 2015/16 are shown in Table A5.3 below.

Table A5.3: Base year (2015/16) fault rates (individual products)²²⁹

Individual Products	Percentage lines faulty per year	Faults per 1000 lines per annum
WLR	8.3%	83
MPF	11.2%	112
SMPF	3.7%	37
GEA-FTTC	4.8%	48

Source: Ofcom analysis of Openreach data

Deriving an appropriate fault rate forecast

- A5.13 Having established actual fault rates for the period 2015/16 in the previous section, in this section we consider what is an appropriate trend in the fault rates and what adjustments may need to be made for later years in the charge control model.

- A5.14 The total volume of faults in a given period can be expressed as the sum of:

²²⁸ We obtained both databases from Openreach using our formal powers.

²²⁹ The average of the two subtractions (WLR+GEA-FTTC) - WLR = 5.1% and (MPF+GEA-FTTC) - MPF = 4.4% is used for the GEA-FTTC value.

- the volume of faults that occur on newly installed service within 28 days of installation, known as early life failures, which equal the product of the number of new connections in the period and the early life failure rate (ELFR); and
- the volume of faults that occur on a service after it has been in service for more than 28 days, known as in life faults (ILFs), which equal the product of the number of line rentals,²³⁰ and the in life fault rate (ILFR) per year.

A5.15 To forecast likely longer term trends in overall fault rates (OFRs), we have considered the relative contributions from in life fault and early life failure rates to overall fault rates to enable us to assess the extent to which trends in both these types of faults could significantly affect future overall fault rates. To understand the relative contributions of in life fault rate (ILFR) versus early life failure rate (ELFR), we have considered the following equation for the overall fault rate:

$$\text{OFR} = \text{ILFR} + \text{PNC} \times \text{ELFR}$$

where PNC is the Percentage of New Connections and is equal to the number of new connections ÷ number of line rentals.

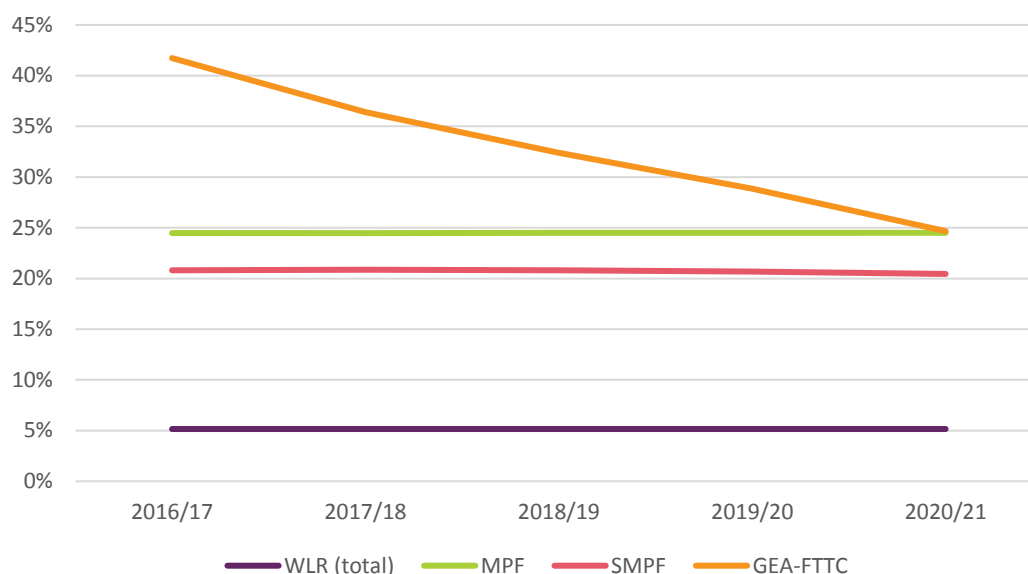
A5.16 Figures A6.29 to A6.31 show the trends for the historical overall fault rates, in life fault rates, and early life rates for the combined services. We note the following trends:

- OFRs: WLR and MPF only are broadly flat. There is a marginal increase in WLR + SMPF and a significant decrease in both WLR + FTTC and MPF + FTTC.
- Early Life Failures (ELFs): WLR-only and MPF only vary within a narrow range over the period, while WLR simultaneously provided with SMPF and FTTC both show a slight increase over the period. MPF+FTTC shows an increased ELF rate over the period, almost doubling from 2011/12, but has stabilised at a similar rate to WLR + FTTC since 2013/14.
- In Life Faults (ILFs): as with the overall fault rates the ILF rates for WLR and MPF are broadly flat, WLR + SMPF shows a slight rise, and WLR + FTTC and MPF + FTTC show a sharp decline.

A5.17 Figure A5.1 below sets out the forecast PNC for the individual services, i.e. the forecast number of new connections divided by the forecast number of line rentals.

²³⁰ Also known as working system size (WSS).

Figure A5.1: Forecast new connections as percentage of installed base (PNC – percentage of new connections)



Source: Ofcom analysis

Our views on trends for WLR, WLR+SMPF and MPF

A5.18 Our forecast percentage of new connections for the individual WLR, MPF and SMPF services shows no variation over the forecast period 2016/17 to 2020/21, as we would expect for mature services²³¹. Consequently, absent Openreach's plans for investment in fault reduction, we believe, on the balance of the available evidence, the overall fault rates and the relative contribution of the in life and early life failure rates for these services (and their combinations) will not substantially change over the period of the forthcoming charge control.

Our views on trends for WLR+GEA-FTTC and MPF+GEA-FTTC

A5.19 However, the situation is different for the MPF+GEA-FTTC and WLR+GEA-FTTC services. Here we observe significant reductions in the overall and in life fault rates. The early life failure rate trend for MPF+GEA-FTTC has been nearly flat for the last three years following an initial significant increase, while the WLR+GEA-FTTC rate fluctuates within a narrow range. Our forecast proportion of new connections for GEA-FTTC shows a significant fall, as we would expect for a service with an installed base that has grown rapidly and is now maturing. Consequently, absent consideration of Openreach's plans for investment in fault reduction we believe on the balance of the available evidence that overall fault rates will continue to reduce in the future, i.e. there will be a reduction in the fault rate for WLR+GEA-FTTC and MPF+GEA-FTTC combined services. We discuss the overall reduction in fault rates for WLR+GEA-FTTC and MPF+GEA-FTTC combined services and their likely future values later in this annex.

²³¹ March 2017 WLA Consultation, Annex 10.

Fault volume reduction (FVR) programme

A5.20 One key factor that needs to be considered in relation to trends is the proposed Openreach Fault Volume Reduction (FVR) programme which aims to reduce the volume of faults arising on copper lines through:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

A5.21 The fault rate reduction planned by Openreach is shown in Table A5.4.

A5.22 We discuss in Section 4 the role of investment in reducing faults. In the WLA Market Review Volume 2, Section 2 we discuss that we think it appropriate to include the effects of this investment programme in our cost modelling. We therefore consider below how to incorporate the planned reductions in fault rates in our forecasts.

Table A5.4: Openreach FVR program – Openreach forecast reduction in overall fault rates across all products

Charge control period				First year	Second year	Third year			
	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
Overall fault rate (faults per annum per 1000 lines)	110	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Percentage reduction relative to base year	Base Year			[REDACTED]%	[REDACTED]%	[REDACTED]%			

Source: Ofcom analysis of Openreach data

Forecast fault rates for WLR, MPF and SMPF

A5.23 We set out above that, absent consideration of Openreach's planned network investment programme, we expect no substantial change in the future WLR, MPF and WLR+SMPF fault rates. However, Openreach's FVR programme is a specific intervention to reduce fault volumes and rates for the copper lines. Consequently, we believe it is reasonable to assume that the FVR programme will reduce the future WLR, MPF and WLR+SMPF fault rates in line with the reduction shown in Table A5.4 above.

A5.24 Therefore, we expect the overall fault rates for WLR, MPF and WLR+SMPF to reduce each year in the charge control relative to the base year fault rate (2015/16) by the percentages shown in Table A5.4. Our resulting proposals for fault rates are set out in Table A5.5.

Table A5.5: Forecast fault rates for combined products over period of charge control including Ofcom interpretation of effects of FVR programme

	Base Year 2015/2016	Year 1 2018/2019	Year 2 2019/2020	Year 3 2020/21
WLR	8.3%	[X]%	[X]%	[X]%
MPF	11.2%	[X]%	[X]%	[X]%
WLR+SMPF	12.0%	[X]%	[X]%	[X]%
SMPF	3.7%	[X]%	[X]%	[X]%

Source: Ofcom analysis of Openreach data

Forecast fault rates for FTTC

- A5.25 We concluded earlier that the fault rates for the WLR+GEA-FTTC and MPF+GEA-FTTC combined services are likely to continue to fall. We now present our thoughts on how much they are likely to fall and our proposed fault rate forecasts for the FTTC related services.
- A5.26 We are unable to derive reliable fault rate forecasts for GEA-FTTC related services directly from the measured data we obtained because the fault rate changes significantly over time and does not obviously converge towards specific values. We believe this is because FTTC deployment is not yet mature.
- A5.27 To determine fault rates for FTTC related services in future years, we first consider the network components involved in delivering the FTTC related services and, where relevant, their likely fault rates based on delivering other, more mature services. We use the measured fault rates for the base year 2015/16 to be consistent with the charge control model and other fault rate forecasts. We then consider how the measured FTTC service fault rates we obtained align with our expectations. Finally, we explain our choice of proposed fault rates for FTTC related services.

Network components and their expected fault rates

- A5.28 FTTC introduces additional network elements into the access network and changes how the existing copper elements of the access network are used. Consequently, we start our analysis of the expected contributions to the overall faults rates by considering the following key network components and their use:
- the basic copper components comprising
 - those ‘d-side elements’ between the copper cabinet (Primary Cross Connection Point – PCP) and the customer’s network including d-side cable, drop-wire and any internal wiring for which Openreach is responsible;
 - the e-side cable between the PCP and the exchange; and
 - the main distribution frame (MDF) in the exchange which connects the copper lines (e-side cable) to exchange based equipment and the line test equipment;
 - FTTC equipment which includes the active electronic equipment, the fibre backhaul cable and the tie cable (copper) between the active electronic equipment cabinet (FTTC cabinet) and the copper cabinet (PCP); and

- connections (jumpers) in the PCP to connect the various copper line elements to the FTTC equipment (via the tie cable).

A5.29 Table A5.6 below presents the fault rates for the various copper and PCP components for the base year 2015/16 when used to deliver the three mature services, i.e. WLR, MPF and WLR+SMPF. These were derived from the fault database and line biography we obtained from Openreach using our statutory information gathering powers.

Table A5.6: Measured component fault rates for mature services

	d-side elements	PCP	e-side cable	MDF	Overall ²³²
WLR	[X]%	[X]%	[X]%	[X]%	8.3%
MPF	[X]%	[X]%	[X]%	[X]%	11.2%
WLR+SMPF	[X]%	[X]%	[X]%	[X]%	12.0%

Source: Ofcom analysis of Openreach data

A5.30 When we derive an expected fault rate for a network component carrying broadband signals, we consider both the MPF and the WLR+SMPF fault rates, using them to form a range when they differ. For components carrying just narrowband voice and or line test signals, we use the WLR fault rates.

Expected copper component fault rates in GEA-FTTC service delivery (including the broadband premium)

- A5.31 When delivering WLR only service we expect the copper components to produce their lowest fault rates because they are only carrying narrowband voice signals. When carrying broadband services (MPF and WLR+SMPF) we expect the same copper components to exhibit higher fault rates because the higher frequency signals associated with these services will expose defects that the voice only signals will not expose. We refer to this increase in fault rate as the broadband premium.
- A5.32 In addition to voice, d-side elements carry the GEA-FTTC broadband. We expect the fault rate of the d-side elements to be at least the same as that when carrying MPF or SMPF broadband signals. GEA-FTTC signals have a greater frequency range than standard broadband which could produce a greater fault rate. Consequently, we believe a lower bound for the d-side fault rate is given by the MPF and WLR+SMPF fault rates for this network segment and falls in the range [X]% to [X]%.
- A5.33 E-side cable is expected to only carry narrowband signals, e.g. voice and line test signals, when used in conjunction with FTTC services. Hence we expect the fault rate of the e-side cable in these situations to be the same as when it is used in WLR service delivery, which is [X]%.
- A5.34 MPF and WLR+SMPF services use twice as many MDF jumper connections as the WLR service delivery case. Consequently, we expect the fault rate associated with the MDF jumpers in MPF related cases to be at least twice that of the WLR case. When carrying MPF related broadband signals the fault rate could be greater

²³² Note that the overall fault rate includes an amount representing the fault rate of the line test equipment which is less than 1% of the overall fault rate.

because of the higher frequency signals exposing more defects. However, we do not expect this to be the case when used with GEA-FTTC because the MPF connections at the MDF will only carry narrowband voice and line test signals. Therefore, based on the MDF fault rate of [X<] % for WLR, we expect the MDF fault rate to be [X<] % for MPF.

Expected PCP jumper connection fault rates in GEA-FTTC service delivery

- A5.35 In WLR, MPF and WLR+SMPF service delivery, a single jumper in the PCP connects the copper pair within the d-side cable to the corresponding copper pair in the e-side cable. When delivering GEA-FTTC services, two jumper connectors are used, one connecting the FTTC equipment to the d-side cable and the other connecting the FTTC equipment to the e-side cable.
- A5.36 We anticipate the fault rate of the e-side jumper to be the same as that for the single jumper in WLR because it only carries narrowband voice and line test signals. Given the d-side jumper carries the GEA-FTTC broadband signal, we expect its fault rate to be the same or possibly greater (because of the higher frequency range of the GEA-FTTC signal) than that of a single jumper in the MPF or WLR+SMPF service delivery case.
- A5.37 Therefore, we expect the total fault rate for the jumpers to be [X<] % (e-side) plus [X<] % to [X<] % (d-side), giving a final range of [X<] % to [X<] % for both jumpers.

Expected FTTC equipment fault rates in GEA-FTTC service delivery

- A5.38 We do not have measured fault rates for mature equipment that is sufficiently like the FTTC equipment to use as a basis for estimating the FTTC equipment fault rate. However, using our formal powers we obtained from Openreach, manufacturers' forecast fault rates for and quantities of the components used to construct the FTTC equipment. Using these we derived a fault rate for the FTTC equipment of [X<] %.

Summary of expected network component fault rates for GEA-FTTC service delivery

- A5.39 Table A5.7 below shows a summary of our estimate of the expected faults rates.

Table A5.7: Expected GEA-FTTC service fault rates

	d-side elements	PCP	e-side cable	MDF	FTTC Equip.	Overall ²³³
Expected WLR+GEA-FTTC	[X<] %	[X<] %	[X<] %	[X<] %	[X<] %	12.4% - 14.1%
Expected MPF+GEA-FTTC	[X<] %	[X<] %	[X<] %	[X<] %	[X<] %	13.0% - 14.8%

Source: Ofcom analysis of Openreach data.

Comparison of expected and measured GEA-FTTC related fault rates

- A5.40 Although we have measured faults rates for GEA-FTTC covering the period 2011/12 to 2015/16, we think they do not represent reasonable, stable, long-term fault rate trends for the GEA-FTTC related services. In our view, they portray a

²³³ Note that the overall fault rate includes an amount representing the fault rate of the line test equipment which is less than 1% of the overall fault rate.

service that may be suffering introduction problems that have not yet been resolved, although there are clear signs of the fault rates reducing towards the fault rates of the mature MPF and WLR+SMPF services.

- A5.41 In Table A5.8 we compare the measured fault rates for the FTTC related services for the base year 2015/16 with our estimates of the expected fault rates for the FTTC related services.

Table A5.8: Comparison of expected and measured GEA-FTTC service fault rates

	d-side elements	PCP	e-side cable	MDF	FTTC Equip.	Overall ²³⁴
Expected WLR+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	12.4% - 14.1%
Measured WLR+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	13.3%
Expected MPF+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	13.0% - 14.8%
Measured MPF+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	15.6%

Source: Ofcom analysis of Openreach data

- A5.42 We observe that the overall fault rate for the WLR+GEA-FTTC service is [<]. Comparing the component fault rates for the MPF+GEA-FTTC case suggests this may be due to the [<].
- A5.43 The measured MDF fault rates do not align with our expectations based on the engineering of the service or the evidence for copper services set out above. For example, it is unclear why there would be a [<] fault rate on the MDF for WLR+GEA-FTTC, which uses one less jumper. It is also unclear why this would be [<] than where only WLR is provided, since at the MDF the service and physical configuration is the same.
- A5.44 We also observe that the measured FTTC (equipment) fault rates are [<] than the fault rate calculated from the manufacturers' component fault rates. We note the measured fault rate for MPF+GEA-FTTC is [<] the calculated rate while the WLR+GEA-FTTC rate is [<] the calculated rate. There are several possible reasons for this, but we do not have sufficient evidence to determine which may apply. However, we believe the FTTC related fault rates have not yet stabilised and we consequently treat the measured FTTC equipment fault rates with caution.

Fault rates for GEA-FTTC services for the charge control model

- A5.45 We explain above that we believe the relatively high GEA-FTTC related fault rates currently observed are due to protracted introduction problems. We do not at this point have a basis on which to assume fault rates could be better at this stage of a deployment of new technology. Therefore, we will use the measured GEA-FTTC

²³⁴ Note that the overall fault rate includes an amount representing the fault rate of the line test equipment which is less than 1% of the overall fault rate.

service fault rates for 2015/16 for the base year of the charge control. We then need to set fault rates for the key components of the GEA-FTTC services for the final year of the charge control, assuming at this stage no further reduction arising from the FVR programme. Therefore, we need to select from the above evidence (i.e. our estimates based on measured fault rates of mature services, and the directly measured GEA-FTTC service fault rates) values that we consider are representative of the longer-term fault rates that will apply at the end of the charge control.

- A5.46 We do not consider it appropriate to select the measured fault rates for the GEA-FTTC services as the long-term rates because, while the WLR+GEA-FTTC fault rate [X], we estimated the MPF+GEA-FTTC fault rate [X]. Further, we observed earlier, as well as in Annex 6, that the GEA-FTTC service fault rates are falling. We also observed that the PCP fault rates are [X].
- A5.47 We therefore consider, that it is reasonable and proportionate to select the following fault rate values for the network components:
- [X]% for the d-side elements because this is very close to our lower limit and has been shown to be possible by the WLR+GEA-FTTC measured value;
 - [X]% for the PCP because this is achieved by the mature services;
 - [X]% for the e-side because this is the value most services appear to exhibit;
 - [X]% for the MDF when used to support WLR (in WLR+GEA-FTTC) and [X]% for the MDF when used to support MPF (in MPF+GEA-FTTC) because one uses one jumper while the other uses two jumpers; and
 - [X]% for the FTTC equipment because we believe the measured values for the FTTC equipment are not yet stable and so we have used the manufacturer's calculated fault rates, which we consider provide the best view of long-term fault rates at this point.
- A5.48 These choices lead to a long-term fault rates of 12.5% for WLR+GEA-FTTC and 13.1% for MPF+GEA-FTTC. The difference is due to the additional jumper at the MDF to support the MPF connectivity in the exchange. The choices are summarised in Table A5.9.

Table A5.9: Summary of selected long-term fault rate values for constituent network components of GEA-FTTC services absent further reduction from the FVR programme.

	d-side elements	PCP	e-side cable	MDF	FTTC Equip.	Overall ²³⁵
WLR+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	12.5%
MPF+GEA-FTTC	[<]%	[<]%	[<]%	[<]%	[<]%	13.1%

Source: Ofcom analysis of Openreach data

A5.49 We propose, without the FVR programme, that the long-term fault rates in Table A5.10 should be achieved by the last year of the charge control. We further propose that the fault rates for intervening years follow a linear glide path.

Table A5.10: Proposed glide path for GEA-FTTC service fault rates absent application of FVR programme

Charge control period	Base Year 2015/2016	Year 1 2018/2019	Year 2 2019/2020	Year 3 2020/21
WLR+GEA-FTTC	13.3%	12.8%	12.7%	12.5%
MPF+GEA-FTTC	15.6%	14.1%	13.6%	13.1%

Source: Ofcom analysis of Openreach data

Effect of FVR programme

A5.50 We believe the FVR programme will yield further reductions to the GEA-FTTC service fault rates; these are in addition to the reductions we have applied above to arrive at the long-term fault rates for the GEA-FTTC services. However, we do not believe the FVR will produce a reduction in the largely electronic and physical cabinet based FTTC equipment fault rate of [<]%. Consequently, we only apply the FVR programme reductions (as set out in Table A5.4 above) to the overall fault rate minus the FTTC equipment fault rate.

Table A5.11: Proposed glide path for GEA-FTTC service fault rates including effect of FVR programme

Charge control period	Base Year 2015/2016	Year 1 2018/2019	Year 2 2019/2020	Year 3 2020/21
WLR+GEA-FTTC	13.3%	[<]%	[<]%	[<]%
MPF+GEA-FTTC	15.6%	[<]%	[<]%	[<]%

Source: Ofcom analysis of Openreach data

Proposed fault rates for FTTC service major components for charge control model assuming inclusion of FVR programme

A5.51 We finally separate out the key constituents of the WLR+GEA-FTTC and MPF+GEA-FTTC services by subtracting the WLR and MPF fault rates derived earlier and the calculated FTTC equipment fault rate to produce WLR and MPF adjustment factors. These figures need to be added to the WLR and MPF fault rates

²³⁵ Note that the overall fault rate is assumed to include a fault rate of circa [<] for the line test equipment.

as well as the FTTC equipment fault rate when calculating overall GEA-FTTC plus bearer service fault rates.

Table A5.12: Overall and separated fault rates for GEA-FTTC services and its key constituents assuming further reduction due to FVR programme

	Base year 2015/16	Year 1 2018/19	Year 2 2019/20	Year 3 2020/21
WLR+GEA-FTTC	13.3%	[<]%	[<]%	[<]%
MPF+GEA-FTTC	15.6%	[<]%	[<]%	[<]%
WLR	8.3%	[<]%	[<]%	[<]%
MPF	11.2%	[<]%	[<]%	[<]%
FTTC equipment	1.0%	[<]%	[<]%	[<]%
WLR addition	4.0%	[<]%	[<]%	[<]%
MPF addition	3.4%	[<]%	[<]%	[<]%

Source: Ofcom analysis of Openreach data

- A5.52 We provisionally conclude that by the end of the market review forward look period the GEA-FTTC service will lead to 3.4% additional faults per annum when provided over WLR, and 1.6% additional faults per annum when provided over MPF, compared to 5.0% and 4.4% respectively in 2015/16 (the base year).

Annex 6

Openreach quality of service performance

Introduction

A6.1 In the 2014 FAMR, Ofcom imposed a number of new SMP obligations on BT, including service quality standards covering installations and repair for WLR and MPF. This section sets out our analysis of Openreach's performance against those standards, as well as its performance in the delivery of SMPF and GEA (FTTC and FTTP) services.²³⁶

Sources of data

A6.2 To gain an understanding of current levels of service quality, we relied on a number of sets of data relating to provisioning and fault repairs in the Narrowband and WLA markets.²³⁷

- to investigate QoS performance information, we issued a 1st Section 135 notice to BT on 4 January 2016. BT's response provided information on first available appointment dates (FADs), missed and changed appointments/delivery dates, repairs which exceeded SLA timescales and provision orders which exceeded their contractual delivery date (CDD);
- to investigate recent fault repair volumes and volumes of lines, we issued a 2nd Section 135 notice to BT on 25 May 2016 in which we requested information on fault repairs and line volumes, as well as incidents relating to *force majeure* events (MBORCs).
 - we used this information together with similar information on repairs provided in BT's response to the 6th FAMR QoS information request of 3 March 2014 in order to analyse historic fault repair performance covering the period April 2011 to March 2016;
- to investigate provision order performance, we issued a 3rd Section 135 notice to BT on 19 July 2016. The information included a list of provision orders, as well as data relating to different milestones along the provision order journey;
- to supplement the fault repair data set provided in response to the 2nd s.135 notice described above, we issued a 4th Section 135 notice to BT on 18 November 2016 which requested more granular data on fault repairs to enable us to reconcile data provided in BT's 2nd Section 135 with Openreach's mandatory non-discrimination KPIs; and

²³⁶ We are conscious that performance against most of the reported measures can vary significantly from month to month. We have therefore focused most of our commentary on the overall trends rather than these short term variations.

²³⁷ This was in addition to the mandatory non-discrimination key performance indicators (KPIs) that Openreach report to Ofcom on a monthly basis, as imposed in the 2014 FAMR.

- finally, we issued a 5th Section 135 notice to BT on 15 December 2016 to allow us to perform analysis combining performance to SLAs²³⁸ with data on fault repairs.

Structure of this annex

A6.3 This annex sets out evidence we have gathered and analysis we have carried out for the purposes of reviewing Openreach QoS as part of the WLA market review. We have subsequently used this information and analysis to develop our policy proposals outlined in Sections 5 and 6, which are then summarised in Section 8. In this annex in particular we assess and provide evidence relating to the following areas:

- service demand;
- Openreach's recent provision performance;
- fault rates; and
- Openreach's recent repair performance, including data integrity.

A6.4 We have not reported performance for ISDN30 and ISDN2 in this annex. As stated in the December 2016 Narrowband market review consultation,²³⁹ based on the KPIs reported to Ofcom, Openreach's QoS in providing ISDN30 and ISDN2 over the FAMR period appears to be largely stable with no pronounced, continuous deteriorations in provision or repair performance.

Service demand

Volumes of lines

A6.5 Figure A6.1 below shows the volume of lines since April 2011 for WLR, MPF, SMPF and GEA-FTTC.²⁴⁰ Over this period the volumes of WLR and SMPF lines have decreased, while the volumes of MPF and GEA-FTTC lines have increased. Notably GEA-FTTC lines, which were low at the start of this period, surpassed SMPF lines in volume in August 2016. GEA-FTTP lines, not shown in the chart due to their relatively low volumes, have risen since the start of 2014 but remain at an extremely low level.²⁴¹

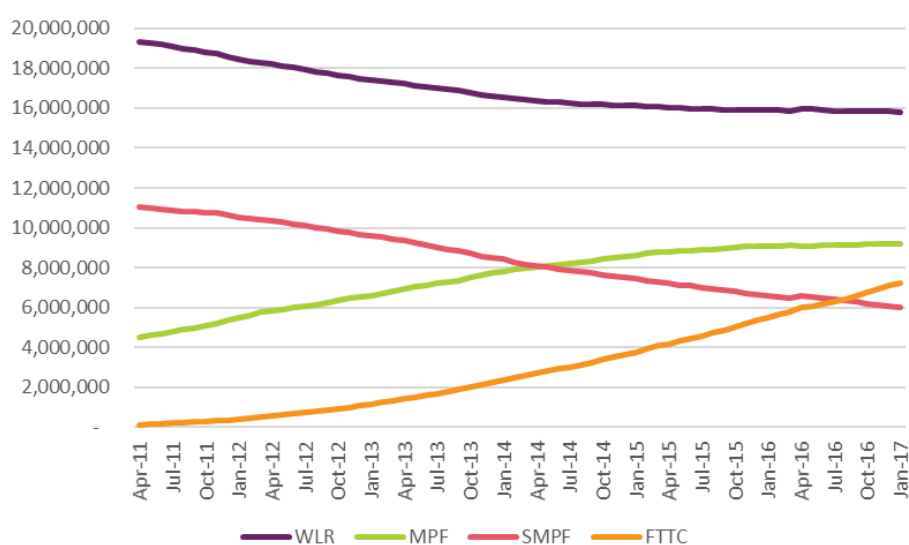
²³⁸ SLAs for repair timescales are based on Service Maintenance Levels (SMLs):

https://www.openreach.co.uk/orpg/home/products/serviceproducts/serviceharmonisation/serviceharmonisation/downloads/SML_fact_sheet_web_vers_phme_61163_2011_09.pdf [accessed 14 March].

²³⁹ https://www.ofcom.org.uk/_data/assets/pdf_file/0016/95011/Narrowband-Market-Review.pdf.

²⁴⁰ In each of the charts contained within this annex, GEA-FTTC and GEA-FTTP are referred to as FTTC and FTTP, respectively.

²⁴¹ Line volumes for FTTP were not sought in the 6th FAMR QoS information request of 3 March 2014 and, as such, are only available from January 2014.

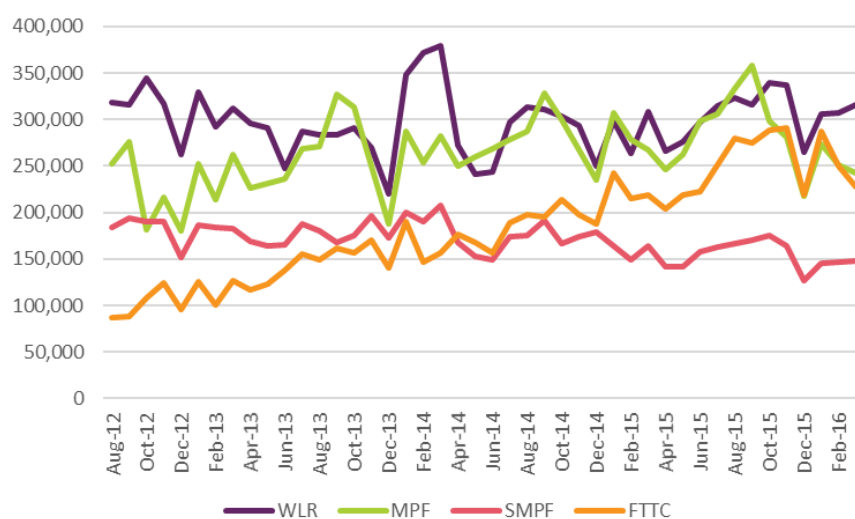
Figure A6.1: UK line volumes²⁴²

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 25 May 2016 and Openreach mandatory non-discrimination KPIs

Volumes of orders submitted

A6.6 Figure A6.2 below shows the total demand for provision orders since August 2012 for WLR, MPF, SMPF and GEA-FTTC. There has been a rise in demand over the period for GEA-FTTC, almost rivalling the levels of WLR and MPF which have remained fairly steady. The demand for SMPF has decreased, with GEA-FTTC volumes exceeding SMPF from mid-2014. The demand for GEA-FTTP, not shown in the chart below due to much lower volumes relative to other services, has risen over the period from fewer than 1,000 lines to circa 4,500.

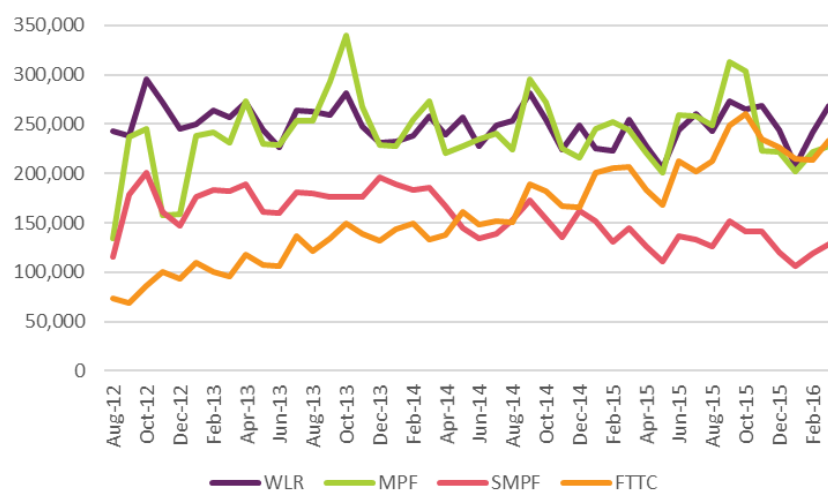
²⁴² This combines weekly line volumes averaged monthly for the period April 2011 to March 2016 with monthly averages provided in Openreach mandatory non-discrimination KPIs for the period April 2016 to January 2017. We note that the small kink in the curves that we observe between March and April 2016 is due to slight differences in volumes in the two data sources, which we consider immaterial for the purposes of this chart.

Figure A6.2: UK monthly volumes of orders submitted

Source: Ofcom analysis of BT data submitted in response to the 3rd QoS information request to BT of 19 July 2016

Volumes of orders completed

A6.7 The monthly volumes of orders completed since August 2012 are shown in Figure A6.3 below for WLR, MPF, SMPF and GEA-FTTC. Although they vary month to month, the volumes of completions remain reasonably steady over the period for WLR and MPF. SMPF has seen a decrease in the monthly volume of orders completed, whereas GEA-FTTC has seen a circa three-fold increase. Completed orders for GEA-FTTP, again not shown in the chart below due to much lower volumes than the other services, has risen over the period from fewer than 1,000 completions to circa 3,000.

Figure A6.3: UK monthly volumes of orders completed

Source: Ofcom analysis of BT data submitted in response to the 3rd QoS information request to BT of 19 July 2016

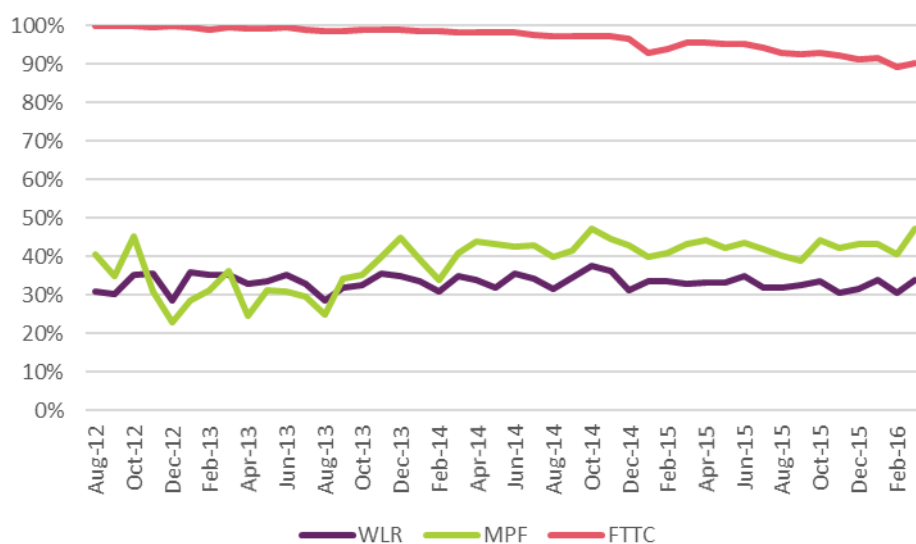
A6.8 There is an observable difference in the levels of orders submitted and completed, the primary reason being the ~11% of orders that are either cancelled by the

telecoms provider/customer, rejected by Openreach, or remain yet to be completed. Provision orders may also transition into a suspended state, typically awaiting information about the order from the telecoms provider/customer. However, these are not included in Figure A6.2 above.

Proportion of appointed provision orders

- A6.9 Figure A6.4 below shows the monthly proportion of completed orders requiring an engineering appointment for WLR, MPF, and GEA-FTTC. Provision orders require an engineering appointment with the customer typically because of the type of installation effort or support involved, as well as whether or not there is an existing line at the customer's home or business premises. Orders requiring an appointment also tend to have longer lead times than those that do not (see Figure A6.18) primarily due to engineer availability and the need to coordinate a suitable time with the customer. Provision orders not requiring an engineering appointment (i.e. a non-appointed order) typically only require exchange jumpering and/or exchange configuration activities.
- A6.10 Since August 2012, appointed WLR provision orders as a proportion of all WLR provision orders have remained steady, while the appointed MPF order proportion has been steady since November 2013 after having a lower level previously (barring a spike in October 2012). The proportion of appointed GEA-FTTC orders has seen a fall since June 2013. SMPF orders are not shown in the figure below due to the proportion of appointed orders being very close to zero, indicating that these orders are typically non-appointed. GEA-FTTP orders are not shown as this service always requires an engineering appointment, except when a GEA-FTTP line already exists at a premises.

Figure A6.4: UK monthly appointed provisions completed of all provision orders completed as a proportion, per service



Source: Ofcom analysis of BT data submitted in response to the 3rd QoS information request to BT of 19 July 2016

- A6.11 This figure suggests that a large majority of FTTC and FTTP orders are appointed (with the former declining over the second half of the period). The proportion of appointed GEA-FTTC orders include basic and managed installations appointed at

the customers' premises, and Primary Connection Point (PCP)²⁴³ only orders appointed at the cabinet, where in the case of the latter the engineer does not need to visit the customer.²⁴⁴

Provision performance for WLR, MPF, SMPF and GEA since the 2014 FAMR to date

A6.12 The following sub-sections use data from the KPIs mandated by the 2014 FAMR and data obtained under our statutory information gathering powers to provide an overview of BT's performance in the provision of WLR, MPF, SMPF, GEA-FTTC and GEA-FTTP in recent years.

Provisions: Average first available appointments dates (FADs)²⁴⁵

WLR and MPF

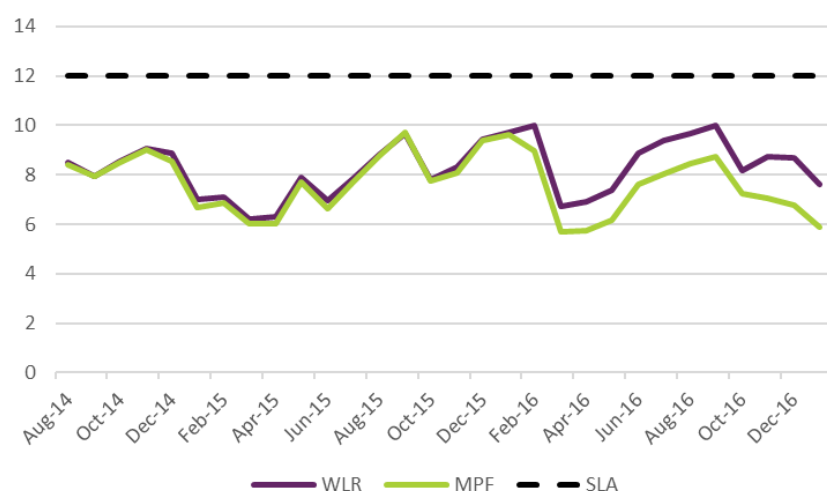
- A6.13 Openreach has industry-negotiated SLAs in place covering engineer appointment availability for WLR and MPF. These are contractual commitments that require BT to offer a telecoms provider an available appointment, where one is required, within 12 working days of application.
- A6.14 Data from the KPIs shows that UK monthly average FADs for WLR and MPF have not risen above the SLA in any month, peaking only as high as ten working days (see Figure A6.5). While this is a UK monthly average and FADs for individual provisions may be earlier or later, we understand that a relationship exists with the percentage of UK faults repaired on time (see Figure A6.35) whereby Openreach may "push out the provision book" when repair demand is unexpectedly high.
- A6.15 For example, peaks of average FADs in September 2015, January to February 2016 and August 2016 roughly correspond to troughs in on time repair performance,²⁴⁶ indicating that Openreach utilising installation resource for fault repair work in periods of necessity, such as adverse weather conditions.

²⁴³ PCPs are commonly referred to as BT's street cabinets.

²⁴⁴ We note that in the case of PCP only orders, this is not consistent with the appointment classification of other services.

²⁴⁵ FAD refers to the first appointment date which is offered by Openreach when an order is submitted. These are not necessarily accepted by the telecoms provider, in which case further appointment dates are offered until a suitable date is reached.

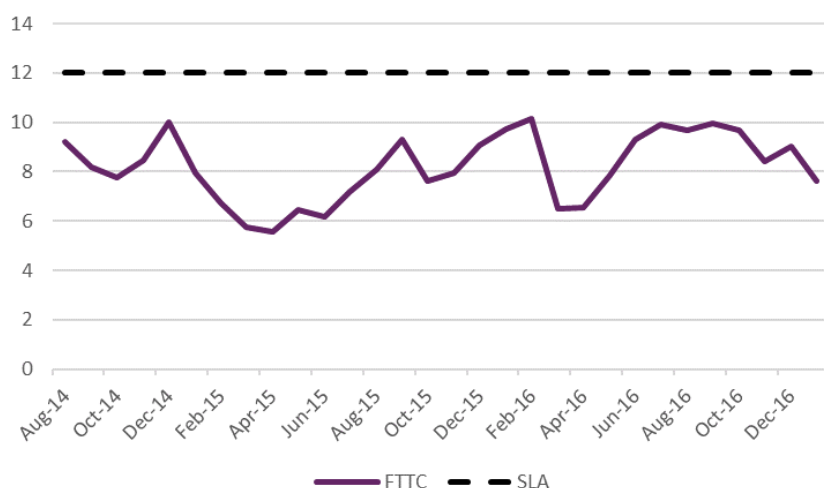
²⁴⁶ Specifically, the percentage of UK faults restored on time for WLR services subject to SML1 and MPF services subject to SML2.

Figure A6.5: UK appointment availability for WLR and MPF (working days)

Source: Openreach mandatory non-discrimination KPIs

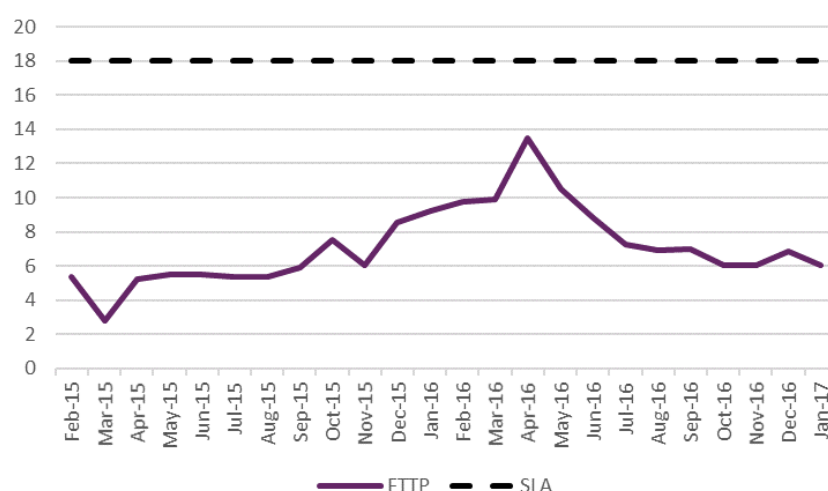
SMPF and GEA

A6.16 The SLA for SMPF and GEA-FTTC is 12 working days, while the SLA for GEA-FTTP is 18 working days. As Figures A6.6 and A6.7 show, UK monthly average FADs for GEA-FTTC and GEA-FTTP provisions across the reporting period have not risen above the SLAs (of 12 and 18 working days, respectively).²⁴⁷

Figure A6.6: UK appointment availability for GEA-FTTC (working days)

Source: Openreach mandatory non-discrimination KPIs

²⁴⁷ The 2014 FAMR does not require BT to submit equivalent KPI data for SMPF.

Figure A6.7: UK appointment availability for GEA-FTTP (working days)

Source: Openreach mandatory non-discrimination KPIs

Provisions: Appointment availability

WLR and MPF

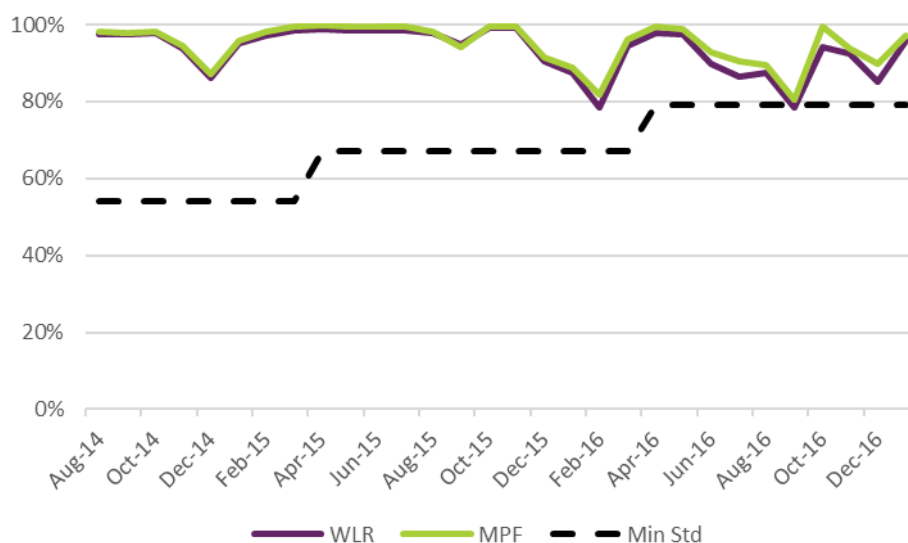
- A6.17 The 2014 FAMR requires that, in a certain percentage of occasions, Openreach offers an engineer appointment, where one is required, for a new WLR of MPF installation within 12 working days of the order being registered by a third party (i.e. a telecoms provider).²⁴⁸ We do not have historical data for this metric as an SLA for appointment availability was not introduced until 2012; however, as stated in the 2014 FAMR, Openreach's delivery against the SLA was just 42% in 2012/13.²⁴⁹
- A6.18 Compliance submissions by BT to Ofcom show that in the first two years of the current market review period Openreach met the appointment availability standards for both WLR and MPF in every region²⁵⁰ – and before any allowance for High Level MBORCs. Information shared by BT shows that it is on track to meet the standards in each region in 2016/17.
- A6.19 Further, as shown by Figure A6.8, the KPIs indicate that over the reporting period²⁵¹ Openreach has achieved the standards at the UK level in all months for MPF and all but one month for WLR.

²⁴⁸ In Year 3 of the current market review period, Openreach is required, for each of the 10 UK regions, to offer an appointment, where one is required, within 12 working days in 80% of occasions (with a 1% MBORC allowance). This standard has increased from 68% in Year 2 and 55% in Year 1.

²⁴⁹ See Table A17.3, page 269: <http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-accessmarket-reviews-2014/statement-june-2014/annexes.pdf>.

²⁵⁰ The 10 regions are East Anglia, London, North East, North Wales & North Midlands, Northern Ireland, Scotland, South East, South Wales and South Midlands and Wessex.

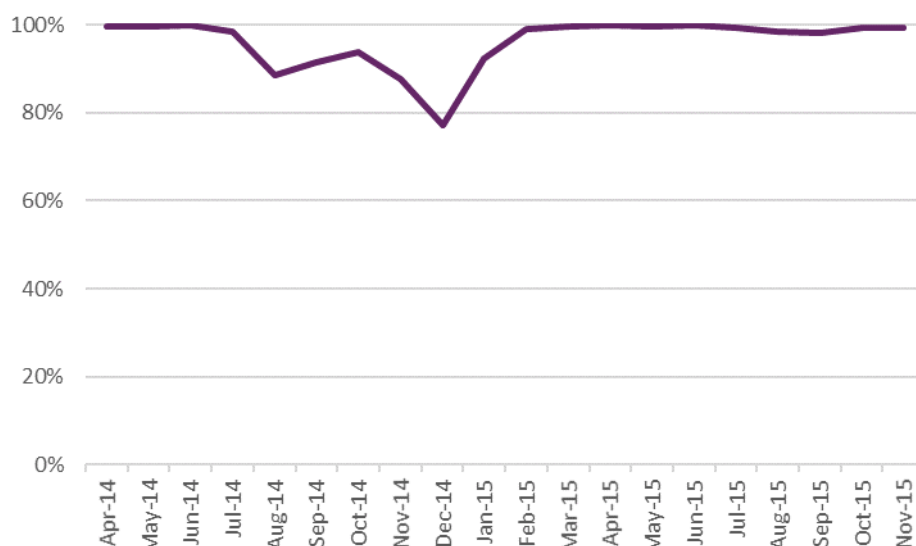
²⁵¹ August 2014 to present.

Figure A6.8: UK 12-day appointment availability for WLR and MPF services (%)

Source: Openreach mandatory non-discrimination KPIs

SMPF and GEA

A6.20 We do not currently impose a specific obligation on BT to achieve a certain performance standard in relation to offering engineer appointments for SMPF²⁵² and GEA services. However, data we have gathered under our statutory information gathering powers shows that GEA-FTTC performance against SLA has often been above 99%, except for in the second half of 2014.

Figure A6.9: UK 12-day appointment availability for GEA-FTTC services (%)

Source: Ofcom analysis of BT data submitted in response to the 1st QoS information request to BT of 4 January 2016

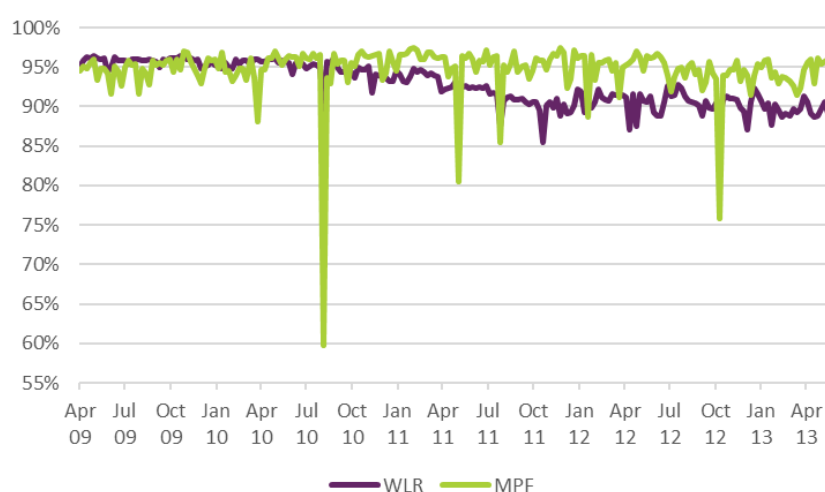
²⁵² As noted above, SMPF services typically do not require an engineering appointment.

Provisions: On time completion

WLR and MPF

- A6.21 The 2014 FAMR requires Openreach to complete 89% of WLR and MPF provisions on the date agreed between Openreach and the customer – i.e. the Committed Date.²⁵³ This is also known in industry as the Contract Delivery Date, or CDD.
- A6.22 In the 2014 FAMR, we found that WLR provision completion rates by CDD were relatively stable around 95% during 2009/10, but declined sharply from early 2010/11. Performance then ranged between 85% and 92% (Figure A6.10).²⁵⁴ UK order completion performance for MPF was typically more consistent, with the exception of isolated months.

Figure A6.10: UK WLR and MPF installation order completion by CDD, Right First Time measure (%)²⁵⁵



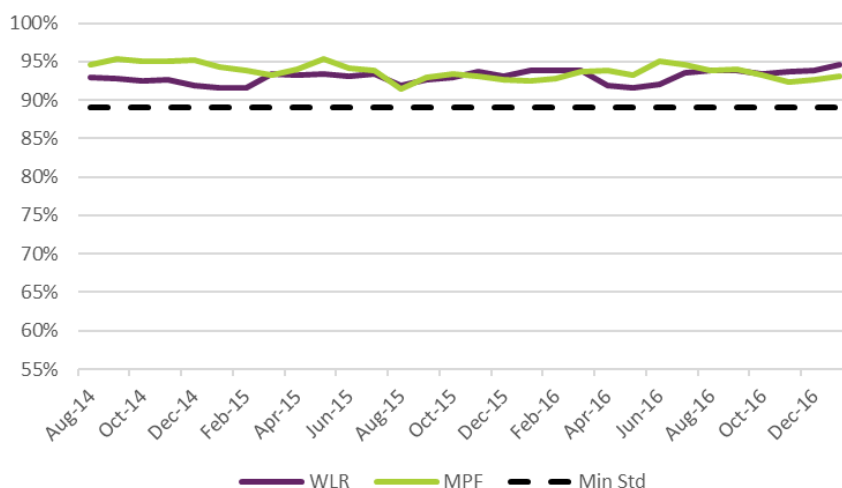
Source: Ofcom analysis of BT data submitted to the OTA and received by Ofcom on 14 June 2013. Data considered supplementary to BT's updated response dated 23 May 2013 to question 1.12 of the First QoS BT Information Request

- A6.23 Compliance submissions made to Ofcom show that in the first two years of the control Openreach met the provision by Committed Date standards for both WLR and MPF in every region. Also, BT monthly reports show that it is on track to meet the standards in each region in 2016/17. As shown by Figure A6.11, the KPIs indicate that since August 2014 monthly average performance at the UK level has not once fallen below the 89% standard.

²⁵³ This is often referred to as 90% of provisions completed by the CDD (with a 1% MBORC allowance). The standard applies in each of Openreach's 10 regions.

²⁵⁴ Our analysis in the 2014 FAMR used 'Right First Time' measures that Openreach reports to the OTA as a proxy for the SLA measure of "installation orders completed by CDD". Both are measures of orders completed by the CDD, but the Right First Time measure additionally classifies orders that develop a fault within eight days of completion as failures.

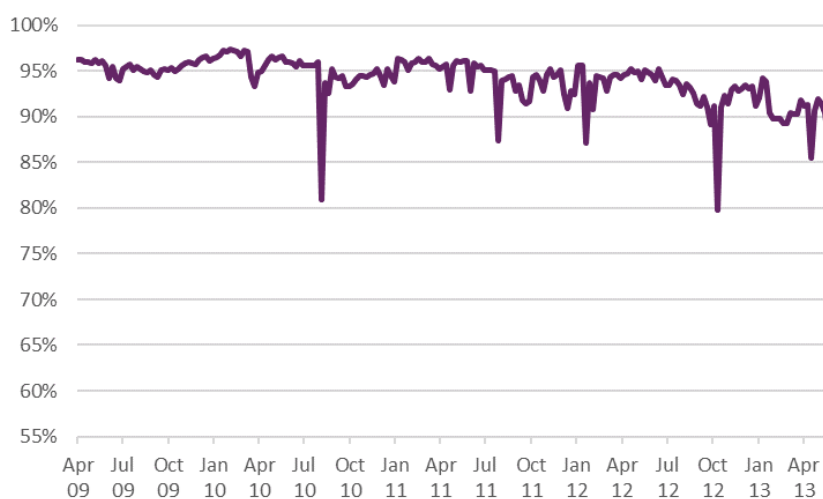
²⁵⁵ WLR includes all WLR2 and WLR3 provide and start order types. MPF includes all provision order types.

Figure A6.11: UK WLR and MPF orders provisioned on time, all orders (%)

Source: Openreach mandatory non-discrimination KPIs

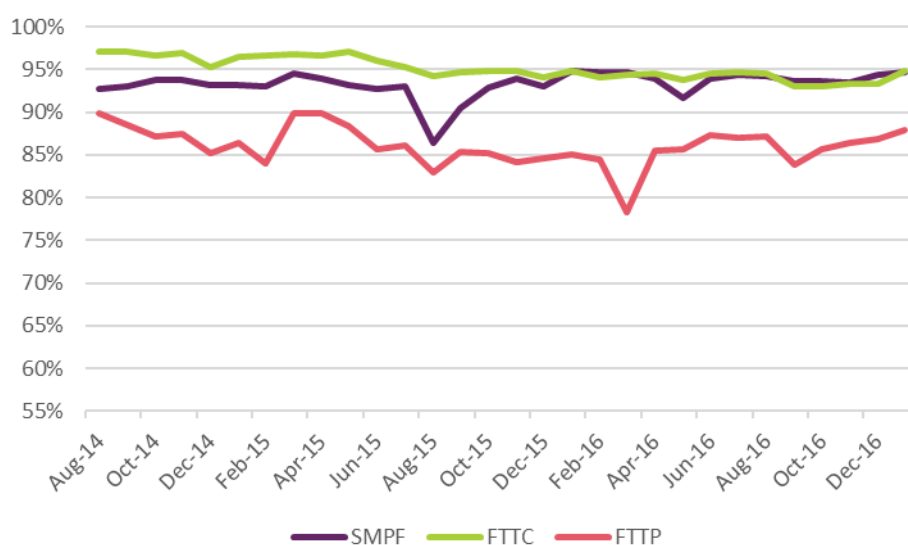
SMPF and GEA

- A6.24 We do not currently require BT to achieve a specific standard in relation to on time provision for SMPF or GEA. We note that installation order completion for SMPF generally ranged between 90% and 96% between April 2009 and October 2012, but then declined over the following six months (see Figure A6.2). However, on time provision performance over the FAMR period has usually been 93% or above, only dropping below 90% in one month.
- A6.25 As shown in Figure A6.12, GEA-FTTC provision by CDD performance has trended very slightly downwards and is now just below 95%. GEA-FTTP has been relatively more variable, ranging between 78% and 90% over the review period. Performance currently sits above the middle of that range.

Figure A6.12: UK SMPF installation order completion by CDD, Right First Time measure (%)

Source: Ofcom analysis of BT data submitted to the OTA and received by Ofcom on 14 June 2013. Data considered supplementary to BT's updated response dated 23 May 2013 to question 1.12 of the First QoS BT Information Request

Figure A6.13: UK SMPF and GEA orders provisioned on time, all orders (%)



Source: Openreach mandatory non-discrimination KPIs

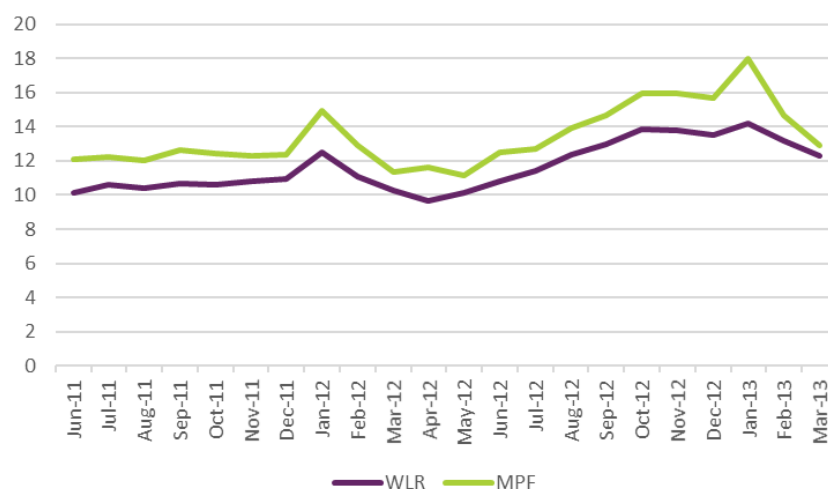
Average installation time

WLR and MPF

- A6.26 Figure A6.14 shows that average time to install (ATTI) for WLR and MPF followed a similar pattern for the period June 2011 to March 2013. The increase in ATTI for both services from early 2012/13 was driven by rising lead times for appointed installation orders which peaked in January 2013. In contrast, ATTI for non-appointed WLR and MPF orders was fairly stable.
- A6.27 Since the 2014 FAMR, average installation time for all WLR orders has typically fluctuated by no more than half a day month-on-month.²⁵⁶ Average installation time for all MPF orders has varied to a slightly greater degree, although performance today is close to the same level as at the start of the review period.

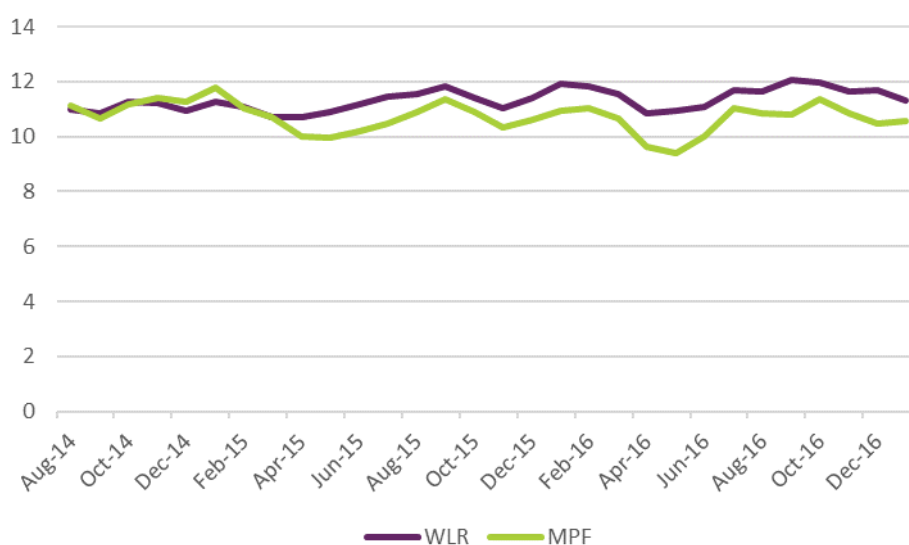
²⁵⁶ All orders includes provisions that require an engineer visit and those that do not. This applies for all services.

Figure A6.14: UK average time to install – installation orders for WLR3 and MPF services (working days)²⁵⁷



Source: Ofcom analysis of BT's response dated 27 February and updated response dated 31 May 2013 to question 1.12 of the First QoS BT Information Request

Figure A6.15: UK average installation time for WLR and MPF, all order types (working days)



Source: Openreach mandatory non-discrimination KPIs

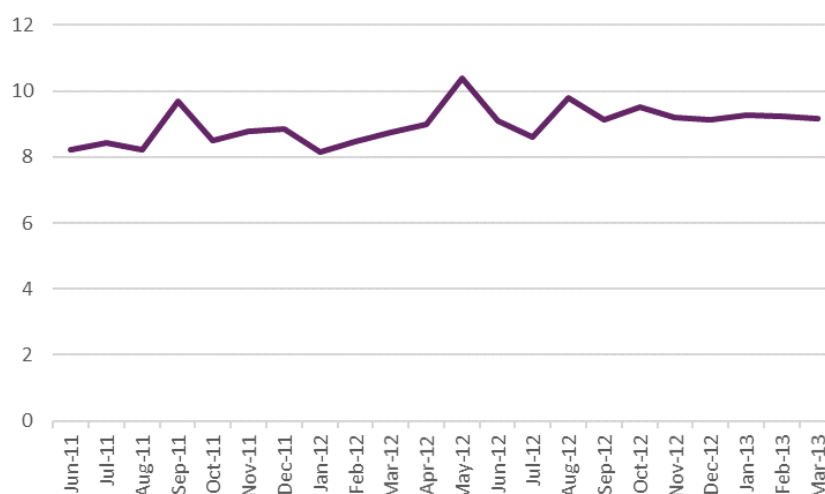
SMPF and GEA

A6.28 Between June 2011 and March 2013 ATTI for SMPF displayed a similar trend to WLR and MPF. There was the occasional peak, but performance was largely stable across the period. As shown by Figure A6.16, GEA-FTTC average installation time has been similarly stable with an average between 15 and 16 working days. In contrast, GEA-FTTP performance has varied by a greater degree month-on-month,

²⁵⁷ WLR3 includes basic and premium orders relating to new provide, start of stop, working line takeover, migration and other provide orders. MPF includes new provide, start of stop, working line takeover, migration and other provide orders. Note that the chart is derived from aggregate figures which are weighted averages of sub-services within each service category.

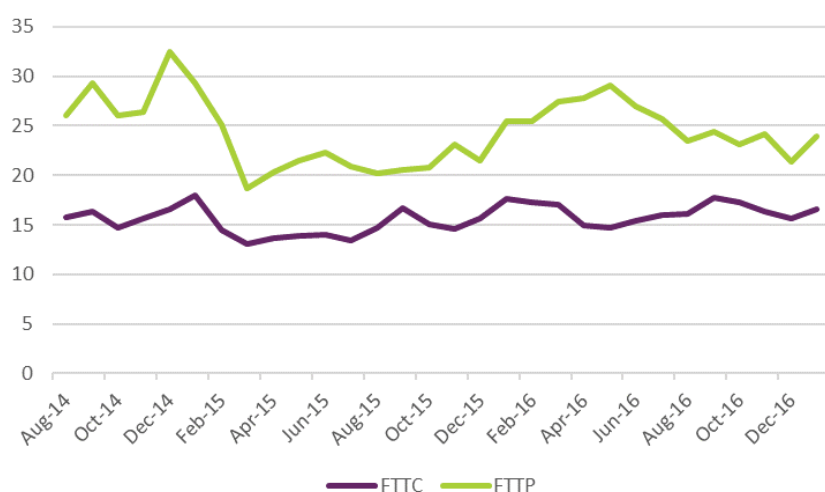
although we note that this could be down to the fact that volumes are relatively much smaller.

Figure A6.16: UK average time to install – installation orders for SMPF services (working days)²⁵⁸



Source: Ofcom analysis of BT's response dated 27 February and updated response dated 31 May 2013 to question 1.12 of the First QoS BT Information Request

Figure A6.17: UK average installation time for GEA, all order types (working days)²⁵⁹



Source: Openreach mandatory non-discrimination KPIs

Appointed orders

A6.29 Orders where an engineer appointment is required typically have longer lead times than those that do not – see Figure A6.18 below which is aggregated for WLR, MPF, GEA-FTTC and GEA-FTTP.²⁶⁰ The primary reason for this is engineer availability but also the fact that installation appointments must be convenient for

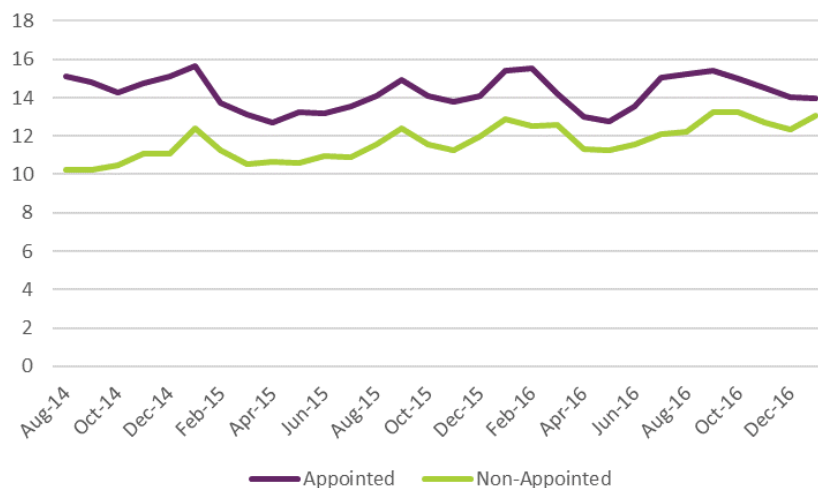
²⁵⁸ SMPF includes new provide, start of stop, working line takeover, migration and other provide orders. We note that the chart is derived from aggregate figures which are weighted averages of sub-services within each service category.

²⁵⁹ BT are not required to report KPIs on average installation time for SMPF. All order types for GEA includes both appointed and non-appointed provisions.

²⁶⁰ This metric is not reported in the KPIs for SMPF so is not included in the aggregation.

the retail telecoms provider and their customer. It is observable in the chart below that there is an increasing trend in ATTI for non-appointed orders which, when analysed by service level, is driven by an increasing trend in ATTI for GEA-FTTC.

Figure A6.18: UK average installation time for appointed and non-appointed orders, in working days

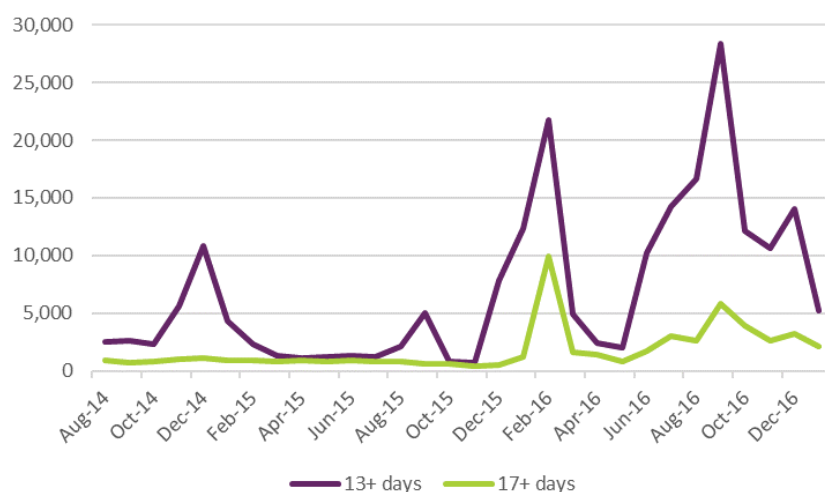


Source: Openreach mandatory non-discrimination KPIs

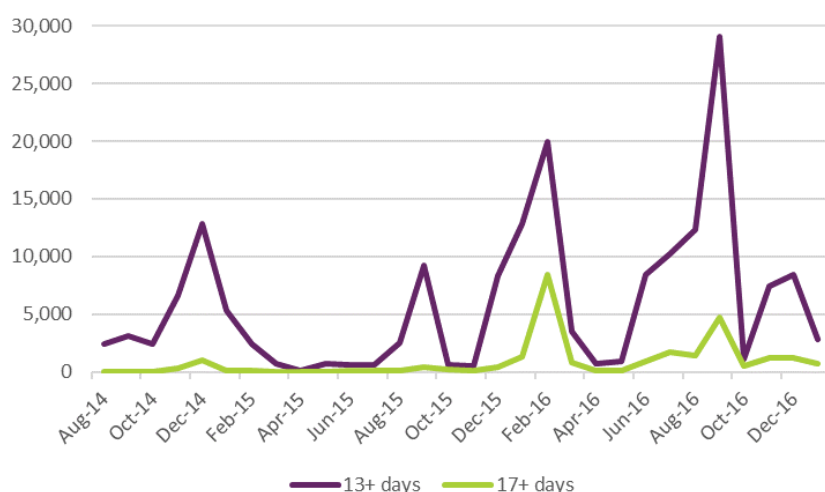
The tail of late provision orders

Volume of first available appointment dates that miss the SLA

- A6.30 Data from the KPIs shows that, at the UK level, the volumes of FADs offered beyond the 12 day SLA have peaked on a number of occasions, but that they are also quick to return to previous levels. This is the case for both WLR and MPF and is a likely due to the diversion of field resource to repair work in response to poor weather.
- A6.31 The volume of FADs offered 22 working days or beyond are not shown in the charts below due to their low volumes compared to those appointments offered 13 or 17 working days or beyond. The number of FADs offered 22 working days or beyond from the day a customer orders their service remains low over the period for both WLR and MPF. The exception to this being a short-lived peak in February 2016 at circa 3,500 for WLR and 2,700 for MPF.

Figure A6.19: UK appointed WLR orders with first available dates over 12 working days

Source: Openreach mandatory non-discrimination KPIs

Figure A6.20: UK appointed MPF orders with first available dates over 12 working days

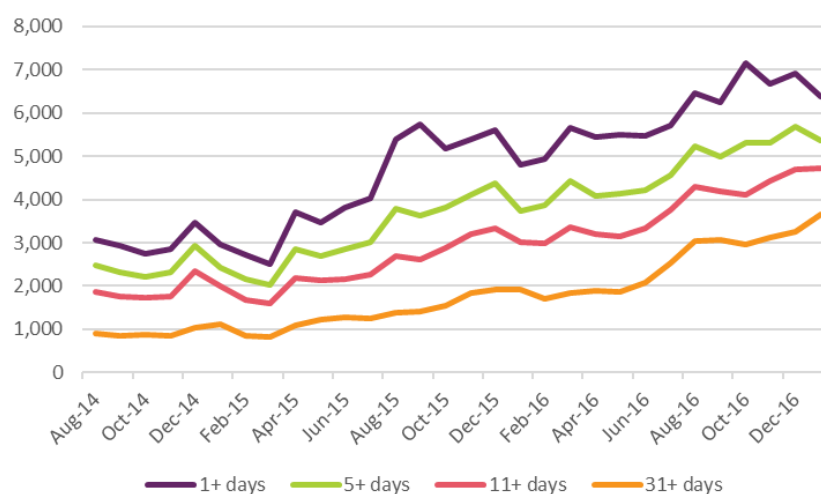
Source: Openreach mandatory non-discrimination KPIs

Volumes of appointed provisions completed beyond the CDD

A6.32 The KPIs show that, at the UK level, the average daily number of appointed orders not provisioned by their CDD has been increasing since early 2015/16.²⁶¹ For example, appointed WLR orders provisioned 31 or more days late have more than trebled over the FAMR period. Appointed MPF orders not provisioned on time had begun to decline from December 2015; however, that trend then appeared to reverse from May 2016 and performance has not been restored back to the levels experienced at the start of the FAMR period.

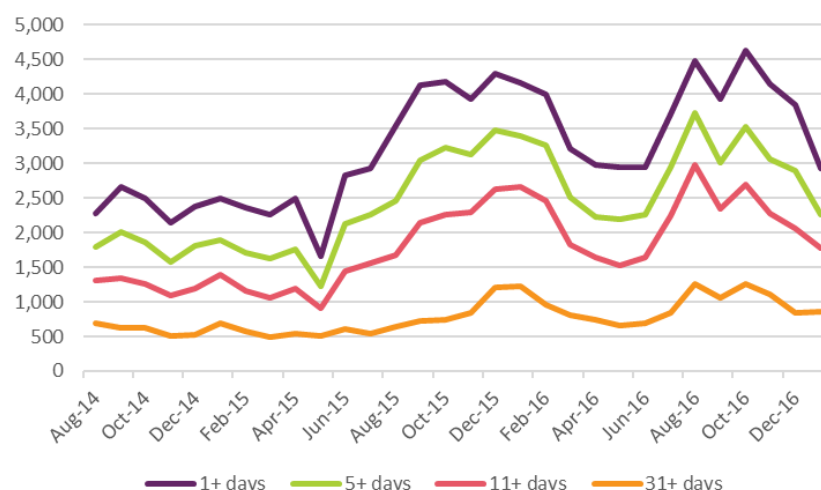
²⁶¹ This KPI makes an average of the total number of appointed orders not completed in the four time brackets for each day, which means that if an order falls into a bracket on more than one occasion (since it has not been completed for two or more days) it is counted as such in the average.

Figure A6.21: UK average daily number of appointed WLR orders not provisioned on time



Source: Openreach mandatory non-discrimination KPIs

Figure A6.22: UK average daily number of appointed MPF orders not provisioned on time



Source: Openreach mandatory non-discrimination KPIs

Other relevant provision issues

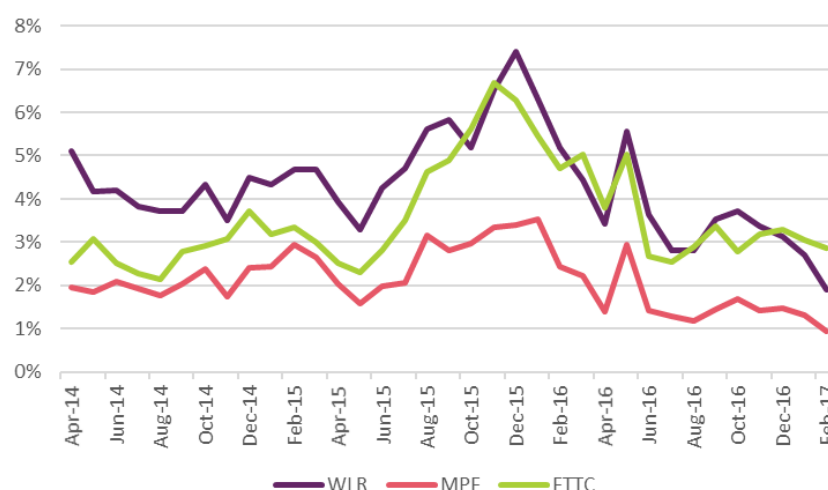
Missed provision appointments

- A6.33 During the course of our QoS review, a number of stakeholders raised concerns about the number of appointments missed by Openreach engineers. Data shared with Ofcom by [redacted] for the period April 2014 to November 2015 indicated that missed provision appointments for MPF, GEA involving a simultaneous provide, and GEA including work undertaken at the PCP (or cabinet) had been steadily increasing between [redacted] and [redacted].
- A6.34 However, discussions with relevant stakeholders in June 2016 indicated that missed appointment figures declined from early 2016 and were, at the time, holding

steady at much lower levels. For example, data provided informally by [3<] shows that between June 2015 and May 2016 Openreach missed 60% fewer [3<] provision appointments, on average, compared with June to November 2015.

- A6.35 Our analysis of data gathered under our statutory information gathering powers shows that there was a visible rise in the percentages of WLR, MPF and GEA-FTTC provision appointments missed by Openreach engineers between June and December 2015 (see Figure A6.23). Nevertheless, this trend reversed during the course of the 2016 calendar year for each of the three relevant services.²⁶²

Figure A6.23: UK WLR, MPF and GEA-FTTC provision appointments missed by Openreach (%)

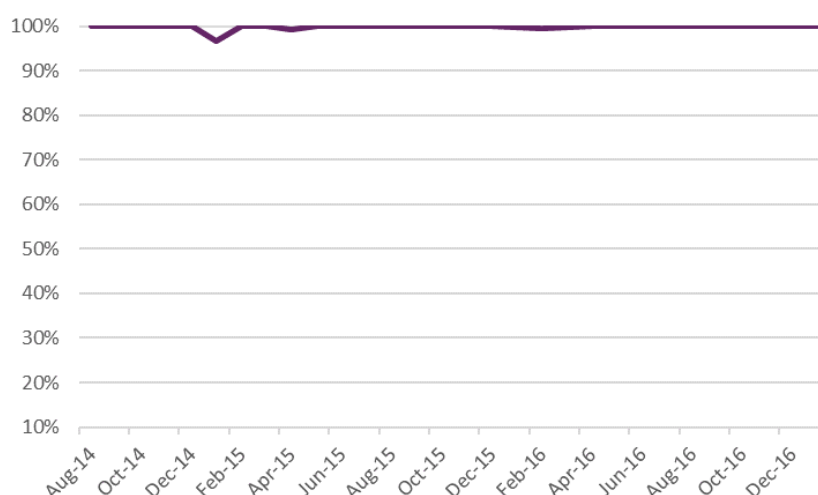


Source: Ofcom analysis of BT data submitted in response to the 1st QoS information request to BT of 4 January 2016 and updated 21 March 2017

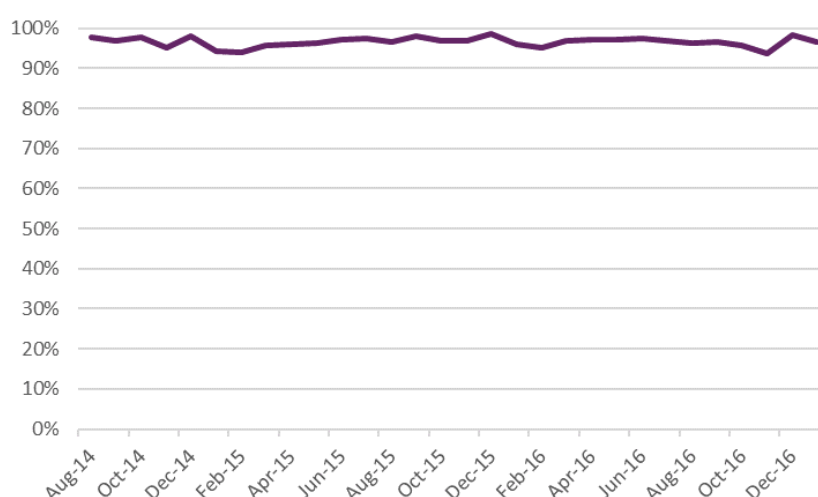
Gateway availability

- A6.36 The KPIs indicate that Openreach ordering gateway availability (excluding scheduled outages) is typically 99-100% apart from one exception in January 2015. Factoring in scheduled outages, availability has generally been between 94% and 98% across the FAMR period.

²⁶² We also note Openreach's public commitment to halve missed appointments to 2.5% by the end of 2016/17. Data available on its website shows that Openreach missed 2.6% of copper and FTTC appointments in Q3 2016/17. See: <https://www.homeandwork.openreach.co.uk/dashboard/overview.aspx?bbf=bshsb-2> [accessed 14 March].

Figure A6.24: UK gateway availability (excluding scheduled outages, %)

Source: Openreach mandatory non-discrimination KPIs

Figure A6.25: UK gateway availability (including scheduled outages, %)

Source: Openreach mandatory non-discrimination KPIs

Fault rates

- A6.37 Consumers will inevitably experience faults with their communication services from time to time. We use the term ‘fault rate’ to describe the propensity of a service to experience a fault in a given year. We measure the fault rate by dividing the number of faults on a service over the year by the number of lines in that year. For example, a fault rate of 10% translates to a line, on average, having a fault once every ten years.
- A6.38 As set out in Section 3, service outages caused by faults can lead to considerable consumer harm. Further, for the purposes of setting regulated charges for BT’s services, it is important to consider what the future fault rate might be as faults give rise to costs, namely network maintenance costs which form a material proportion of the overall cost of services that BT is required to deliver.

- A6.39 As part of our assessment of Openreach's historic fault performance and in order to estimate fault rates for the purposes of setting regulated charges, we typically take all of BT's fault records for the relevant market and then estimate the rate of faults for those services subject to regulated charges. This analysis specifically includes faults related to MPF, GEA-FTTC, SMPF, and WLR, and excludes faults relating to GEA-FTTP and ISDN.
- A6.40 We then exclude certain activities that do not fall within the scope of the regulated or 'in tariff' services we are proposing to charge control. As set out in the Section 4, some faults are within telecoms providers' domains and not Openreach's. We also explained in Section 4 that some faults reported by customers may not appear as faults on the Openreach network when initial diagnostics are carried out by Openreach. In these cases the telecoms provider might request an 'out of tariff' service from Openreach known as Special Fault Investigation (SFI)²⁶³ or Broadband Boost (BBB).²⁶⁴ The charges for SFI and BBB faults are not considered as 'in tariff' for the purposes of the WLA charge control, except where having requested these services and triggered an Openreach visit to the customer, Openreach identifies that the fault was indeed within its domain. In these cases Openreach does not levy a charge on the telecoms provider. Where the fault is due to the telecoms provider or customer equipment, then telecoms providers are liable for an additional charge.
- A6.41 It is for this reason that we exclude SFI and BBB faults not due to a problem on the Openreach network from the 'in tariff' fault rate calculation. We do this by applying a set of filters as set out in Table A6.26 below.

²⁶³ SFI, or SFI2, is a chargeable investigation product that attempts to identify and resolve problems affecting Digital Subscriber Line (DSL) services. They can be initiated by a telecoms provider when an MPF or SMPF service is apparently working within the LLU contractual specification of SIN349 and is testing OK on Openreach line test systems, but there might be a problem with the telecoms provider's Asymmetric Digital Subscriber Line (ADSL) or Symmetric Digital Subscriber Line (SDSL) service.

²⁶⁴ An Openreach chargeable service that aims to improve the speed, quality and reliability of a telecoms provider's customer's broadband line. The service offers an engineering option that covers the customer's, telecoms provider's and Openreach's network to investigate and attempt to resolve issues that may impact the customer's DSL service.

Table A6.26: Filtering for fault rate analysis²⁶⁵

Filter description	Volume of faults filtered for fault rate analysis
Initial faults data set	26,129,612
Internal BT service lines	574,089
GEA-FTTP faults	13,573
ISDN faults	609,244
Based on clear codes (incl. SFI2/BBB)	11,390,736
UNKNOWN, UNCLASSIFIED, and NOT APPLICABLE asset categories	254,182
Final subset of faults	13,287,788

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

- A6.42 Having applied the necessary filters, we then take the final number of faults and divide it by line volumes in order to arrive at an annual fault rate.²⁶⁶ This is calculated by dividing the total faults over a given time period by the average volume of lines over the same time period.
- A6.43 Tables A6.27 and A6.28 show the annual volumes and proportions of BBB and SFI faults remaining after the above filters are applied. Effectively, these are the BBB and SFI faults where a fault in the Openreach network was detected and which consequently was not charged to the telecoms provider.

Table A6.27: Annual volume and proportion of ‘in tariff’ BBB faults

	2011/12	2012/13	2013/14	2014/15	2015/16
BBB	[X]	[X]	[X]	[X]	[X]
BBB faults after filters applied	18	22	54	90	216
BBB faults after filters applied (%)	[X]	[X]	[X]	[X]	[X]

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

²⁶⁵ Clear codes not related to the main distribution frame (MDF), exchange equipment, customer apparatus and line, optical consolidation rack (OCR) fibre, Very-high-bit-rate Digital Subscriber Line (VDSL) cable harness, DSLAM mains power repair, NGA proactive repair (including the FTTC cabinet), fault not found (FNF) local line, internal cabling and accessories, underground (exchange and distribution side), and fibre and radio in the access networks are excluded.

²⁶⁶ Attributed to financial years.

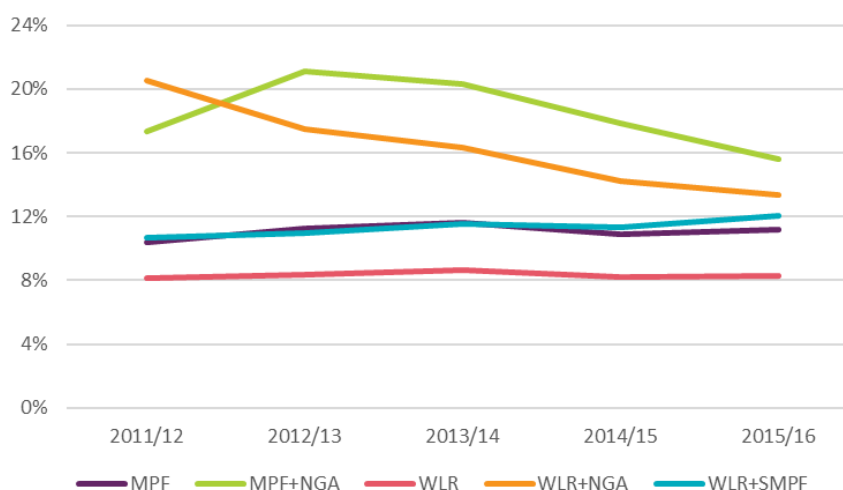
Table A6.28 Annual volume and proportion of ‘in tariff’ SFIs

	2011/12	2012/13	2013/14	2014/15	2015/16
SFI	278,923	248,112	255,428	253,524	281,151
SFI faults after filters applied	14,222	19,329	25,202	28,355	38,700
SFI faults after filters applied (%)	5.1%	7.8%	9.9%	11.2%	13.8%

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

A6.44 Openreach’s fault rates are captured by their asset category, i.e. the combination of services that are active on a line. Where there are multiple services on a line (e.g. a simultaneous provide of WLR+SMPF) we would ideally have liked to disaggregate the fault rate associated with each of the services. However, the data that Openreach’s systems capture does not allow us to perform this level of analysis to a sufficient level of accuracy. We have therefore grouped services together where necessary.

A6.45 Figure A6.29 below sets out the annual fault rates for each financial year from April 2011. This shows a slight increasing trend over the period for WLR+SMPF, while WLR and MPF have remained at a reasonably steady rate. Conversely, services with fibre lines start the period at a higher level than copper-based services and decrease over the period.²⁶⁷

Figure A6.29: Annual fault rates, for each asset category (%)

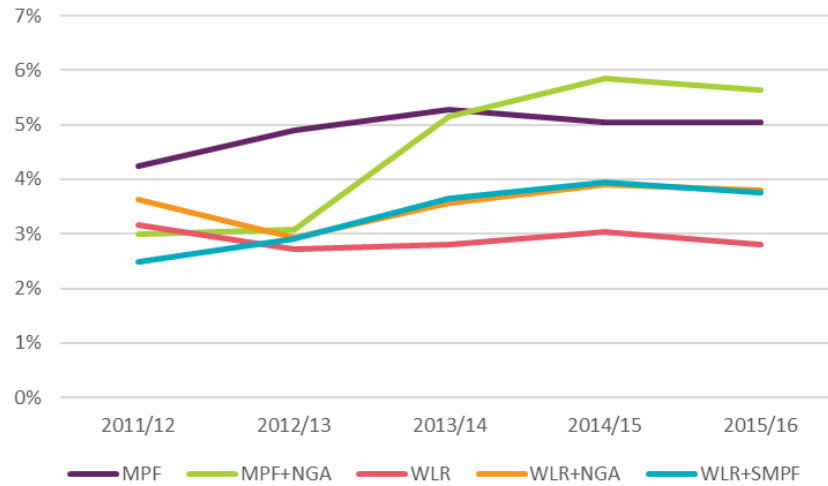
Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

A6.46 Early life failure (ELF) rates, which measure the proportion of faults occurring within 28 days of the installation of a new line installation, are set out in Figure A6.30. WLR-only and MPF-only vary within a narrow range over the period, while WLR simultaneously provided with SMPF and GEA-FTTC both show a slight increase

²⁶⁷ BT uses ‘NGA’ in its response to our s.135 notices; here, ‘NGA’ refers to lines where GEA-FTTC has been simultaneously provided with either WLR or MPF.

over the period. MPF+GEA-FTTC shows an increasing ELF rate over the period, almost doubling from 2011/12, but has stabilised at a similar rate to WLR+GEA-FTTC since 2013/14.

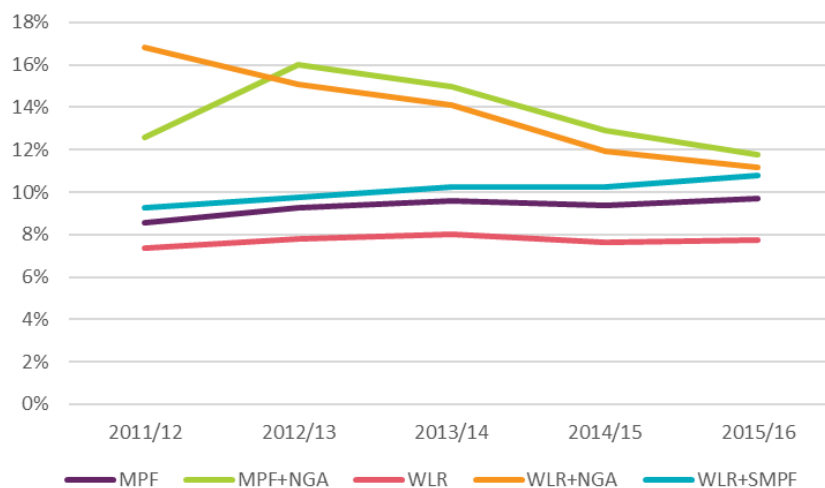
Figure A6.30: Annual early life failure (ELF) rates, for each asset category (%)



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

A6.47 In life fault (ILF) rates, which measure the proportion of faults occurring 28 days after installation, are set out in Figure A6.31. As in the case with overall fault rates, MPF+GEA-FTTC and WLR+GEA-FTTC begin the period higher than the other asset categories but exhibit a decreasing trend. MPF and WLR are broadly flat, and WLR+SMPF shows a slightly increasing trend.

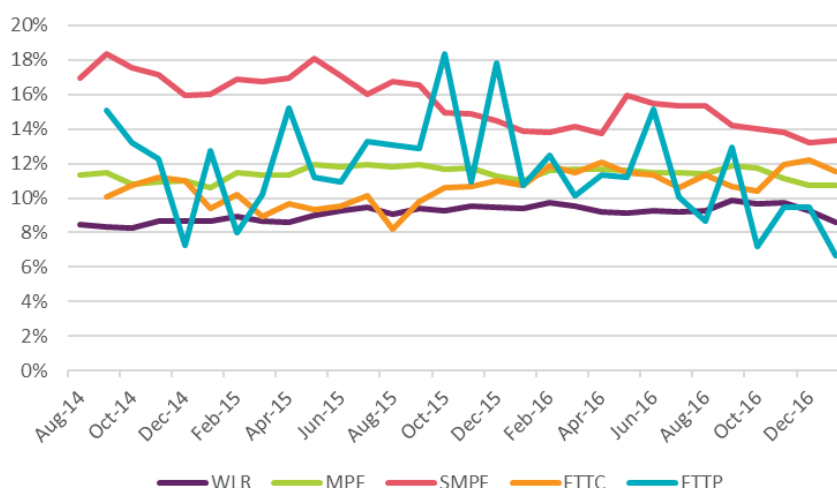
Figure A6.31: Annual in life fault (ILF) rates, for each asset category (%)



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014 and the 2nd QoS information request to BT of 25 May 2016

A6.48 The percentage of repeat faults, where a repeat fault is a fault occurring within 28 days (or 30 days depending on the service)²⁶⁸ of a previously closed fault repair, is set out in Figure A6.32. GEA-FTTP and GEA-FTTC faults show variability over the period, with GEA-FTTP faults decreasing and GEA-FTTC faults increasing. There is a slight increase for WLR, while MPF has remained broadly flat. SMPF shows a decreasing trend over the period, however it remains at a higher level than the other services.

Figure A6.32: Percentage of repeat faults, per service on a monthly basis (%)



Source: Openreach mandatory non-discrimination KPIs

Repair performance for WLR, MPF, SMPF and GEA since the 2014 FAMR to date

Repair data integrity

A6.49 In undertaking our analysis of Openreach's service performance we have relied on a number of different data sources, including KPIs reported to Ofcom and data provided by BT to Ofcom under statutory information gathering powers. Inevitably there are some overlaps in the areas of performance covered by these different data sets.

A6.50 In comparing outputs derived from different sources of evidence, we have observed differences in some repair performance metrics. This was particularly the case when analysing fault repair data using the KPIs on the one hand and additional data provided by BT following an information request on the other. Our investigation found that these differences were a result of some additional categories of faults included in the data gathered under our statutory information gathering powers, which were not relevant to our analysis. Consequently, we applied a different set of filters to the initial list of faults than those applied for the fault rates analysis, thereby ensuring that our analysis of repair performance relied on a consistent set of data. Table A6.33 sets out this different set of filters:

²⁶⁸ The 2014 FAMR requires BT to report KPIs on faults occurring within 28 calendar days of a previously completed fault for LLU (MPF and SMPF) and GEA, and within 30 calendar days for WLR, ISDN30 and ISDN2.

Table A6.33: Filters applied to fault repair data set

Filter description	Volume of faults filtered for repair performance analysis
Initial faults data set	[X]
Internal BT service lines	[X]
Broadband Boost jobs	[X]
Special Fault Investigations	[X]
Non-customer faults (excl. Northern Ireland)	[X]
Missing Data Date	[X]
Final subset of faults	[X]

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 25 May 2016 and the 4th QoS information request to BT of 18 November 2016.

A6.51 Once we applied this different set of filters to the initial list of faults such that we were confident that we were looking at the most relevant fault dataset, we estimated that there was an average discrepancy of [X]% across the metrics compared.²⁶⁹ We believe the source of this error can be narrowed to the following two reasons:

- the [X]; and
- there are a small number of fields, relating to appointment times, which were not requested in the data set provided.

A6.52 With these low level and known sources of error, we regard the average discrepancy in the data as acceptable.

A6.53 As a result, the following sub-sections use data from both the KPIs mandated by the 2014 FAMR and data obtained under our statutory information gathering powers to provide an overview of BT's performance in relation to WLR, MPF, SMPF, GEA-FTTC and GEA-FTTP repairs in recent years.

Repair performance against contractual timescales

WLR and MPF

A6.54 In the 2014 FAMR, we identified two periods in which WLR and MPF performance was of particular concern to telecoms providers: July 2010 to February 2011 and the second half of 2012 (see Figure A6.34 below).²⁷⁰ We considered that the overall

²⁶⁹ These metrics included monthly volume of fault repairs, monthly volume of fault repairs completed within SLA, and monthly proportion of fault repairs completed within SLA.

²⁷⁰ The 2014 FAMR used the 'First Touch, Last Touch' repair measures that Openreach reported to the Office of the Telecoms Adjudicator (OTA) as a proxy for the SLA measures of repairs against contractual timescales over a four-year time period. 'First Touch, Last Touch' is a measures of faults

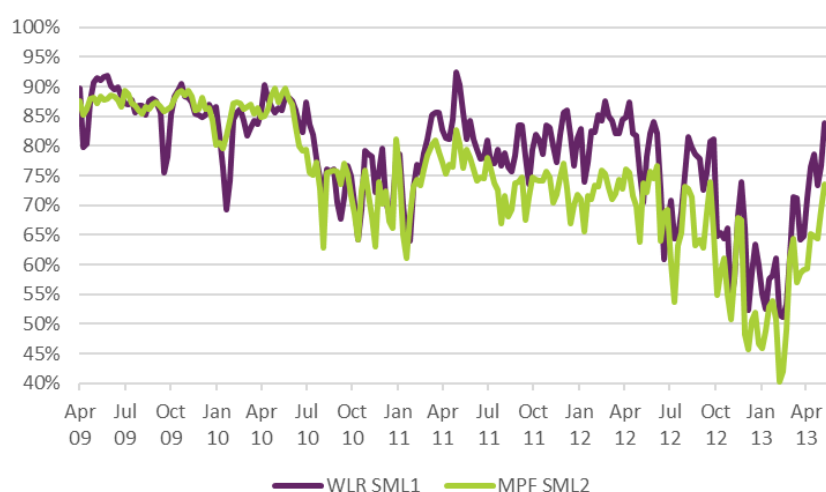
deterioration in performance since April 2009 appeared larger for MPF, possibly reflecting the more demanding repair timescale of SML2 compared to SML1.²⁷¹ The FAMR statement subsequently imposed service standards in relation to the repair of:

- WLR faults that are subject to SML1 by the end of the second working day after such faults have been registered with Openreach; and
- MPF faults that are subject to SML2 by the end of the next working day after such faults have been registered with Openreach.²⁷²

A6.55 The KPIs provided by Openreach indicate that it met the annual FAMR repair standards in the first two years of the control in each of the ten geographic regions and that there has been a reduction in significant volatility in performance identified during the period April 2009 to April 2013.²⁷³ Figure A6.35, which is derived from the KPIs reported by Openreach, shows that UK performance against the relevant repair SLAs since August 2014 has not fallen below 68% in any given month. However, performance has not quite returned to 2009/10 levels.

A6.56 The KPIs also indicate that UK on time repair performance for WLR and MPF at SML3 has been similar to, or slightly higher than, SML1 and 2 performance over the FAMR period.

Figure A6.34: UK WLR repair performance at SML1 and MPF repair performance at SML2, First Touch, Last Touch measure (%)



Source: Ofcom analysis of BT data submitted to the OTA and received by Ofcom on 14 June 2013. Data considered supplementary to BT's updated response dated 23 May 2013 to question 1.12 of the First QoS BT Information Request.

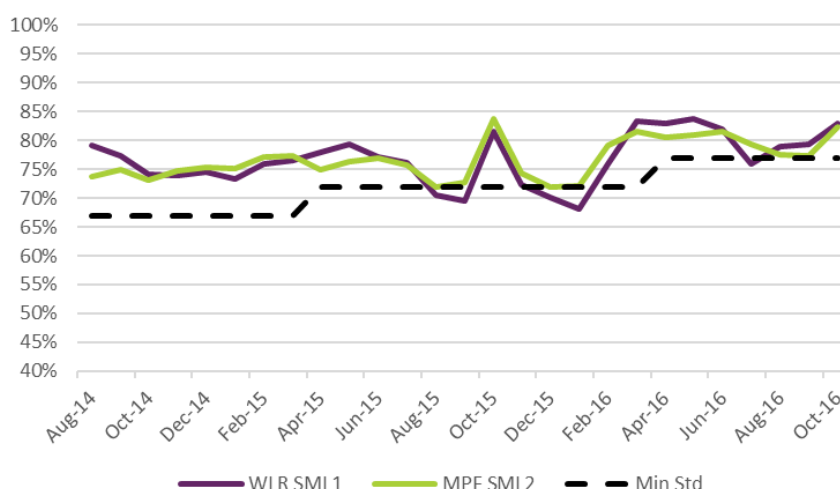
completed within contractual timescales. It is comparable to the 'on time repair performance' reported in Figure A6.35, but includes additional faults that lead to repeat faults within eight days.

²⁷¹ Fault repair timescales are determined by the Service Maintenance Level (SML) attributable to a customer's line. SML1 typically means a 'two day' repair timeframe, while SML2 typically means a 'one day' repair.

²⁷² In the light of the standards imposed in the 2014 FAMR, we have focused our review on performance at SMLs 1 and 2, and only provide commentary on higher care levels in certain cases.

²⁷³ Openreach were required, for each of the 10 UK regions, to complete 70% of repairs within SLA in the first year of the FAMR period, 75% for the second year, and 80% for the third (each with a fixed 3% MBORC allowance).

Figure A6.35: UK faults restored on time for WLR services subject to SML1 and MPF services subject to SML2 (%)



Source: Openreach mandatory non-discrimination KPIs

A6.57 As discussed in Section 5, our 2016 QoS directions implemented new standards that apply to repairs based only on the contracted SML and not the specific service, i.e. a standard on all SML1 lines (WLR and MPF) and all SML2 lines (WLR and MPF). We will assess compliance for the new repair standards over a 17 month period running from 1 November 2016 to 31 March 2018. KPI data correct to the end of January 2017 indicates that Openreach is currently meeting the standards for both care levels.

SMPF and GEA

A6.58 As shown by Figure A6.36, Openreach's SMPF performance between April 2009 and April 2013 exhibited a similar pattern to WLR and MPF, as discussed above. SMPF performance at SML2 since the FAMR has stabilised but has not yet returned to 2009/10 levels (see Figure A6.37).

A6.59 GEA-FTTP performance is typically more variable than GEA-FTTC, although we consider that fluctuations are likely to have a relatively bigger impact on performance given the low volume of lines compared to other services. We note that, had the FAMR applied the same level of repair standards to GEA-FTTP at SML2 as it did to WLR at SML1 and MPF at SML2, the KPIs indicate that UK GEA-FTTP performance would have met the 2014/15 and 2015/16 repair standards in every month.²⁷⁴

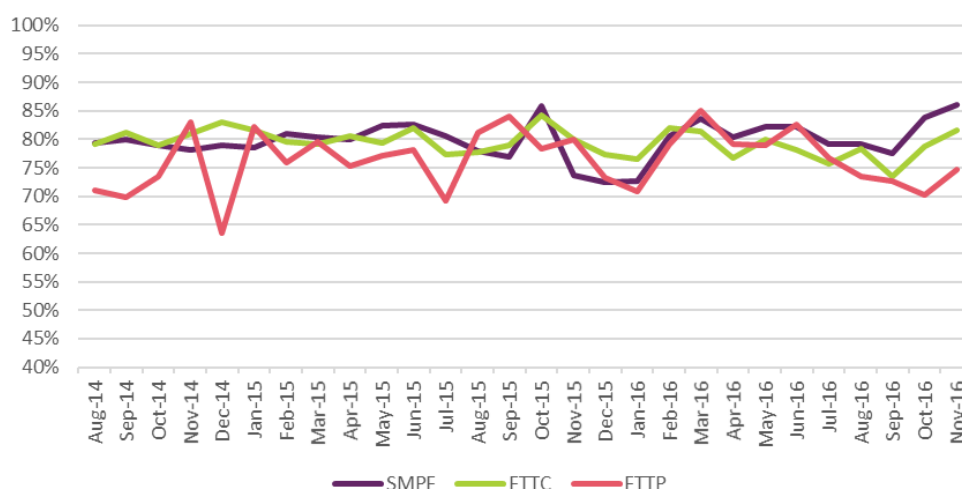
²⁷⁴ We also note that, since August 2014, the percentages of faults repaired on time for SMPF and GEA-FTTP at SML3 at the UK level have been similar to, if not higher than, SML2.

Figure A6.36: UK SMPF repair performance at SML2, First Touch, Last Touch measure (%)



Source: Ofcom analysis of BT data submitted to the OTA and received by Ofcom on 14 June 2013. Data considered supplementary to BT's updated response dated 23 May 2013 to question 1.12 of the First QoS BT Information Request

Figure A6.37: UK faults restored on time for SMPF and GEA services subject to SML2 (%)



Source: Openreach mandatory non-discrimination KPIs

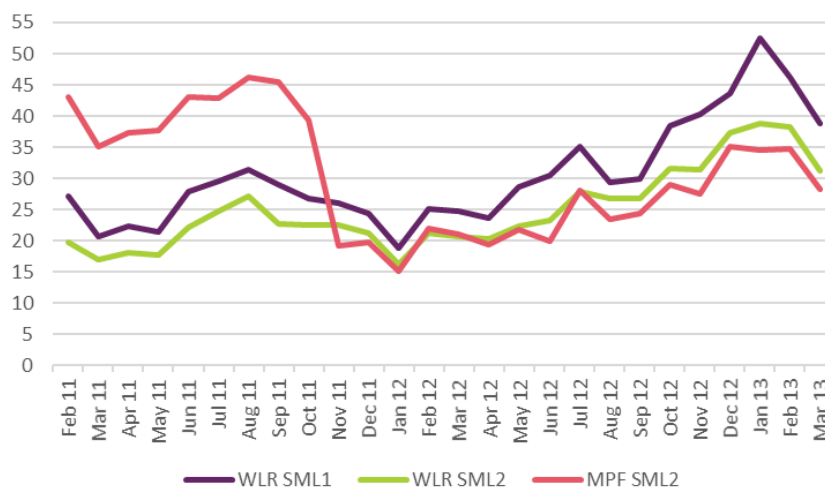
Average time to restore service

WLR and MPF

A6.60 The FAMR used Openreach's 'Average Time to Clear' (ATTC) measure to analyse the average time to complete a repair in working hours. Between August 2011 and January 2012, average clear times for WLR3 faults at SMLs 1 and 2 and MPF faults at SML2 declined before rising steadily through 2012 and peaking at the beginning

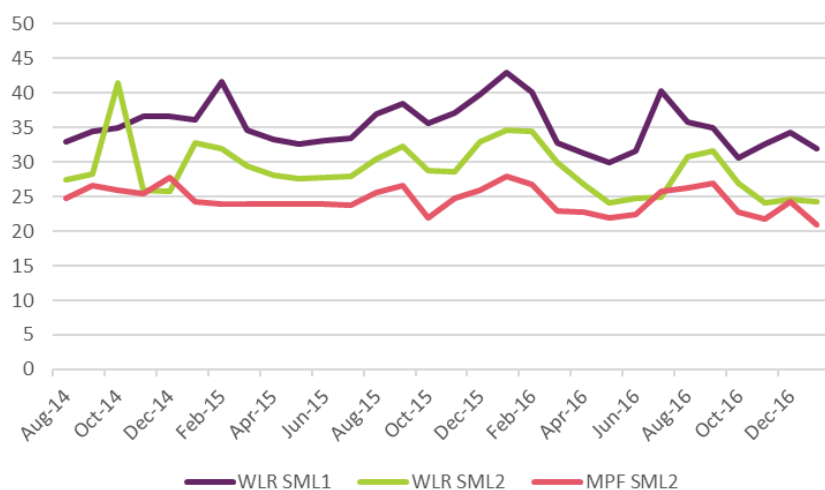
of 2013. As shown in Figure A6.38, average time to repair (ATTR) at SMLs 1 and 2 has stayed fairly constant since the FAMR.²⁷⁵

Figure A6.38: UK average time to clear WLR3 faults at SMLs 1 and 2 and MPF faults at SML2 (working hours)



Source: Ofcom analysis of BT's response dated 27 February and updated response dated 31 May 2013 to question 1.12 of the First QoS BT Information Request.

Figure A6.39: UK average time to restore service for WLR and MPF services (working hours)



Source: Openreach mandatory non-discrimination KPIs.

SMPF and GEA

A6.61 As in the case of WLR3 and MPF, ATTC for SMPF faults at SML2 declined between summer 2011 and January 2012 before rising throughout 2012 (see Figure A6.40). ATTR performance for SMPF and GEA-FTTC at SML2 has remained

²⁷⁵ We note that UK ATTR for WLR and MPF at SML3 has been broadly similar to SMLs 1 and 2 for most of the current review period.

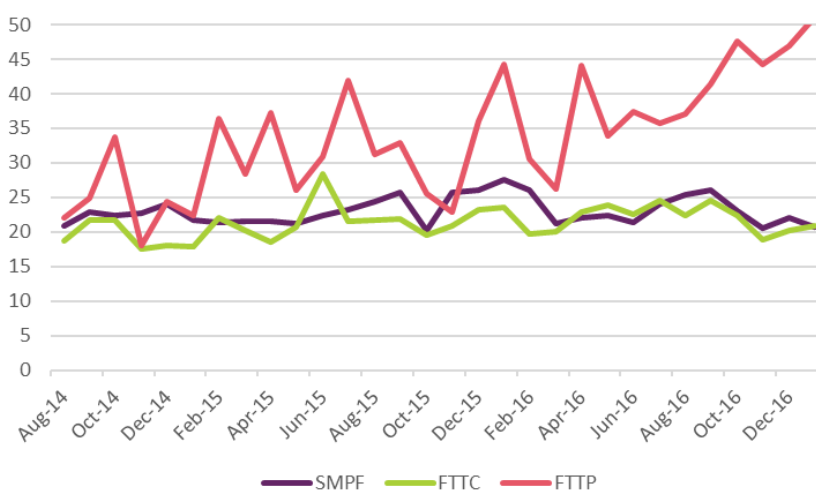
relatively flat over the FAMR period;²⁷⁶ however, GEA-FTTP has fluctuated to a greater extent and the average repair time has more than doubled over this time period.²⁷⁷

Figure A6.40: UK average time to clear SMPF faults at SML2 (working hours)



Source: Ofcom analysis of BT's response dated 27 February and updated response dated 31 May 2013 to question 1.12 of the First QoS BT Information Request.

Figure A6.41: UK average time to restore service for SMPF and GEA services subject to SML2 (working hours)



Source: Openreach mandatory non-discrimination KPIs

²⁷⁶ We note that UK ATTR for SMPF at SML3 has been broadly similar to SML2 for most of the current review period, but GEA-FTTC average repair times at SML3 have doubled.

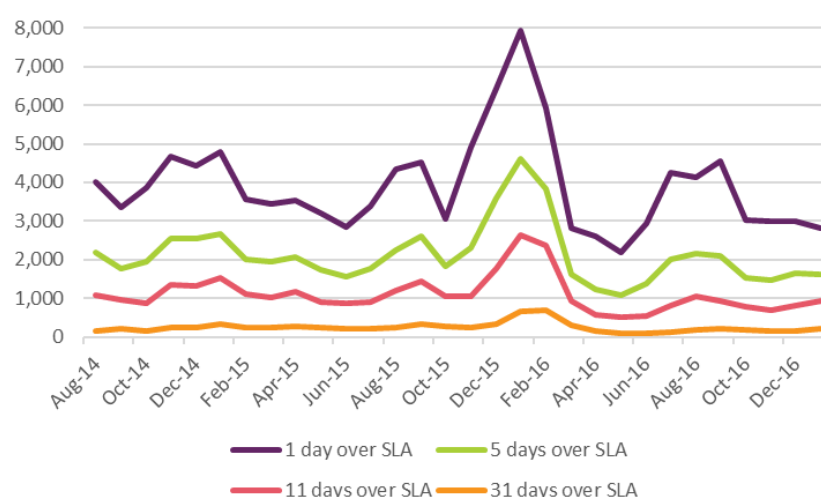
²⁷⁷ We consider that this is likely to be due to the relatively lower volumes of FTTP compared to other services.

The tail of late fault repairs

Faults not resolved on time

A6.62 The average daily number of WLR faults subject to SMLs 1 and 2 which missed the SLA remained fairly flat between August 2014 and October 2015 before rising steadily through winter 2015 (see Figure A6.42). Nevertheless, the average daily numbers of faults one day, five days, 11 days and 31 days late are now lower than when compared to the beginning of the review period.

Figure A6.42: UK average daily number of WLR faults subject to SMLs 1 and 2 not resolved on time



Source: Openreach mandatory non-discrimination KPIs

A6.63 Barring a small peak in January 2016, the KPIs show that the average daily number of MPF faults subject to SML2 that were not completed within SLA followed the same pattern as WLR between August 2014 and March 2016.²⁷⁸

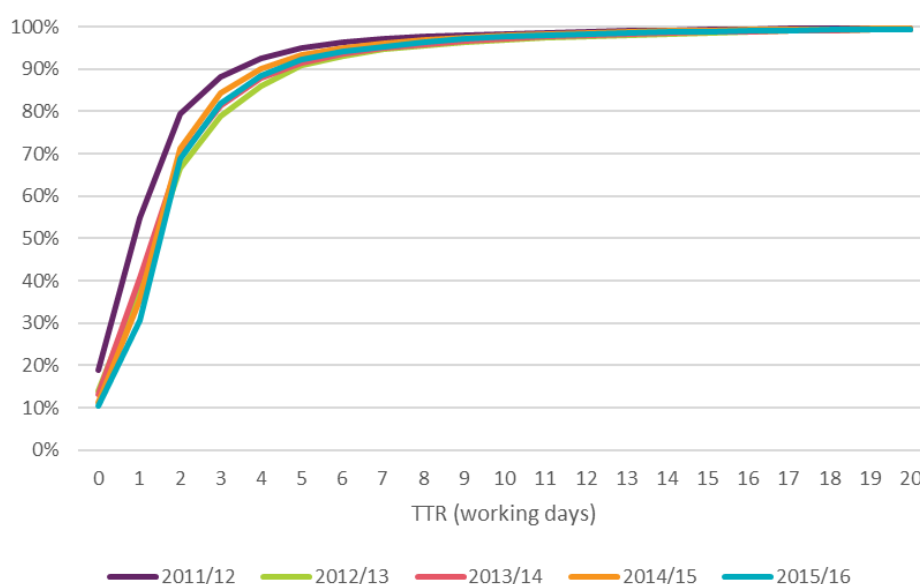
Fault repair distributions

A6.64 To observe the overall repair time performance, we have analysed the time to repair (TTR) distributions for WLR SML1 and MPF SML2 (see Figures A6.43 and A6.44).

A6.65 For WLR, which until recently was predominantly purchased at SML1 with a repair SLA of two working days after the fault was reported, 2011/12 was the best performing year. Overall TTR performance then declined in 2012/13 and 2013/14, before improving in the following two years.

²⁷⁸ We note that from the start of 2016/17 a number of telecoms providers moved a large proportion of their customers using MPF from SML2 to SML1, which is reflected in a steep downward trend in the average daily number of MPF faults subject to SML2 which missed the SLA.

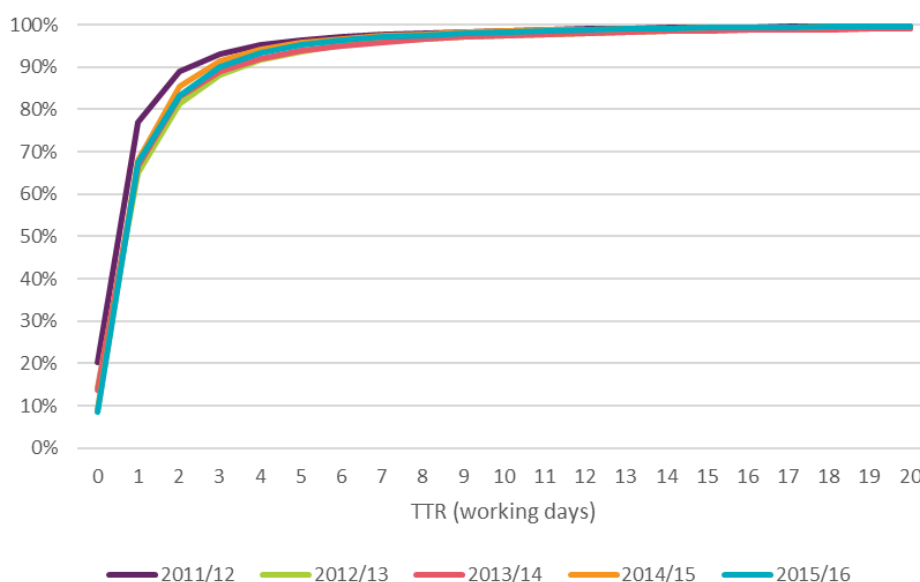
Figure A6.43: UK WLR SML1 fault repair TTR distributions



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 18 November 2016 and the 5th QoS information request to BT of 15 December 2016

A6.66 For MPF, which until recently was predominantly purchased at SML2 with a stricter repair SLA of end of next working day, 2011/12 was the best performing year. The following two years showed a slight performance deterioration, before subsequent improvement in 2014/15 and 2015/16.

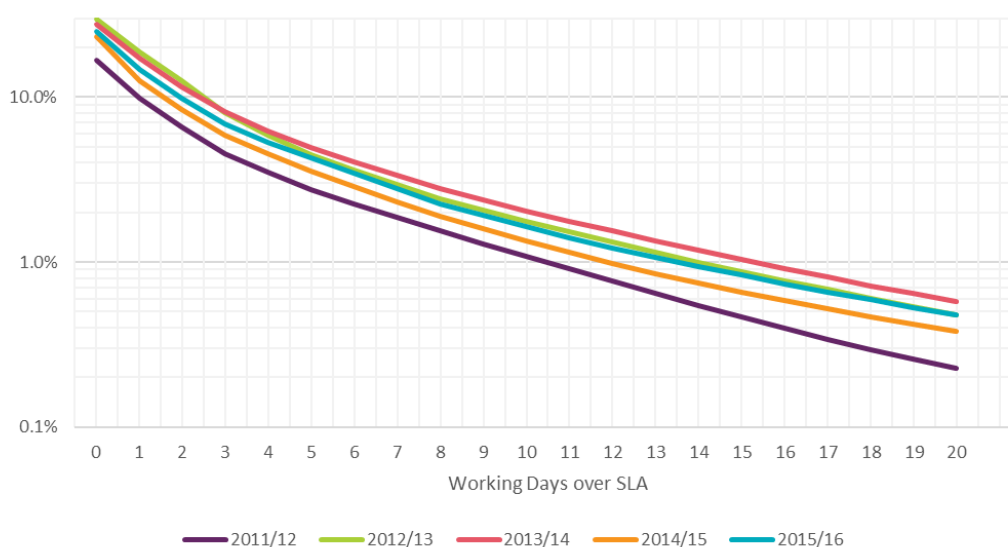
Figure A6.44: UK MPF SML2 fault repair TTR distributions



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 18 November 2016 and the 5th QoS information request to BT of 15 December 2016

- A6.67 Although the above figures allow observation of the overall repair time distribution, they do not take into account the difference between repair SLAs and TTR. Typically, a one working day TTR for an SML2 fault and a two working day TTR for an SML1 fault would reflect the standard repair SLAs. However there are exceptions and in these cases the TTR does not suitably reflect SLA timescales.²⁷⁹ To address this, we have constructed distributions for the number of working days over SLA fault repairs were completed, using day zero to represent repairs completed on time.
- A6.68 Figure A6.45 shows this working days over SLA distribution for WLR, MPF and FTTC at SML1 per financial year, where 2011/12 has the highest level of performance observed with circa 10% of repairs completed within one working day over SLA.

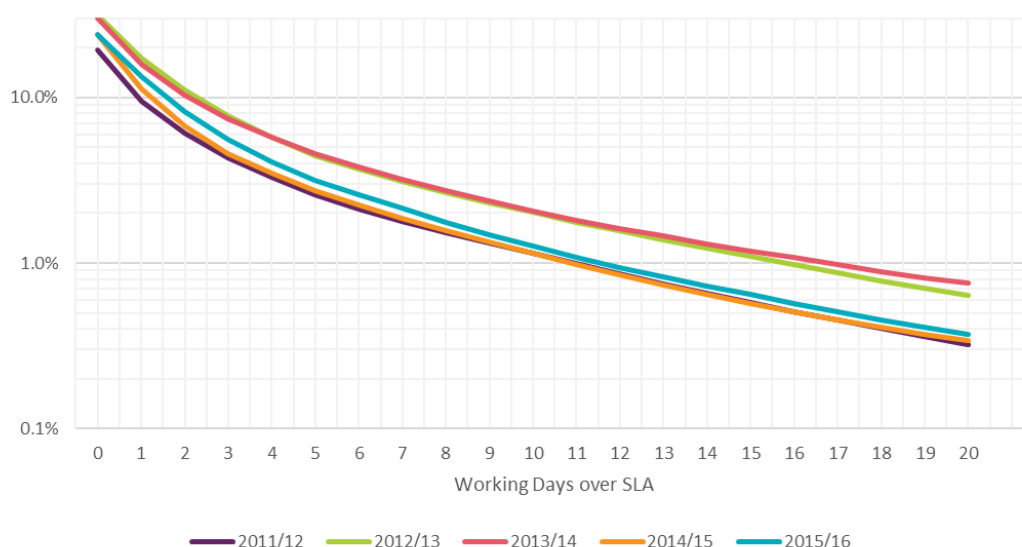
Figure A6.45: UK SML1 fault repair over SLA distributions, by financial year



Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 18 November 2016 and the 5th QoS information request to BT of 15 December 2016

- A6.69 Figure A6.46 shows the working days over SLA distribution for WLR, MPF and GEA-FTTC at SML2 per financial year, with 2012/13 and 2013/14 showing slightly worse performance than the remaining years.

²⁷⁹ These exceptions include any telecoms provider/customer delay resulting in “repair parked time”, and when a customer requests an engineering appointment beyond the fault repair’s standard SLA (for appointed repairs).

Figure A6.46: UK SML2 fault repair over SLA distributions, by financial year

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 18 November 2016 and the 5th QoS information request to BT of 15 December 2016.

Other relevant repair issues

Force majeure events

A6.70 *Force majeure* events²⁸⁰, include, but are not limited to, extreme weather events and damage to the Openreach network by third parties, and have the potential to cause a fault repair to miss its SLA. In the 2014 FAMR, we decided to allow for two types of MBORC events (Local MBORCs²⁸¹ and High Level MBORCs²⁸²) when assessing compliance with the QoS standards.

A6.71 To analyse the occurrences of MBORC events since the FAMR, Openreach has provided us with the volume of MBORCs²⁸³ within SLA and exceeding SLA for each region, service, and SML. From this we have calculated the proportion of fault repairs that exceeded SLA which were impacted by MBORCs (both Local and High Level), as shown in Table A6.47, where we observe a significant fall in this proportion after 2013/14.²⁸⁴

²⁸⁰ Often referred to as Matters Beyond Our (BT's) Reasonable Control, or MBORC.

²⁸¹ E.g. criminal, intentional, or negligent damage to the network.

²⁸² E.g. incidents affecting over 2,000 lines, incidents which are/are likely to become the subject of regional or national media interest, and anything likely to have a significant impact on the BT and/or Openreach brand.

²⁸³ Both Local and High Level, although Local MBORCs within SLA was required to be calculated from those exceeding SLA based on an estimated factor provided by Openreach.

²⁸⁴ The decline we observe is due to a combination of poor weather in 2013/14 and benign weather since, and a strong effort on Openreach's behalf in improving their recovery response, as a result MBORC declarations tend to be shorter.

Table A6.47: Proportion of fault repairs exceeding the SLA impacted by MBORCs²⁸⁵

	2013/14	2014/15	2015/16
Total fault repairs	3,627,660	3,704,068	3,889,674
Total fault repairs impacted by MBORC	536,015	131,468	135,622
% of fault repairs impacted by MBORC	14.8%	3.5%	3.5%
Total fault repairs impacted by MBORC that missed SLA	291,679	56,769	62,737
% of fault repairs impacted by MBORC that missed SLA	54.4%	43.2%	46.3%
% of fault repairs that missed SLA impacted by MBORC	8.0%	1.5%	1.6%

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 18 November 2016 and of BT data submitted in Openreach email to Ofcom dated March 2017

A6.72 The standards imposed in the 2014 FAMR make allowances for High Level MBORCs in up to two regions per year within their compliance calculations. Therefore, as shown in Table A6.48, we have removed the High Level MBORCs exceeding the SLA in the two most impacted regions in the three relevant years from the proportion of fault repairs exceeding the SLA impacted by MBORCs (bottom row of Table A6.47).

²⁸⁵ We note that the percentage of fault repairs impacted by MBORC that missed the SLA calculated here for 2013/14 is larger than the corresponding calculation in the 2014 FAMR due to the use of filtered volumes for total fault repairs.

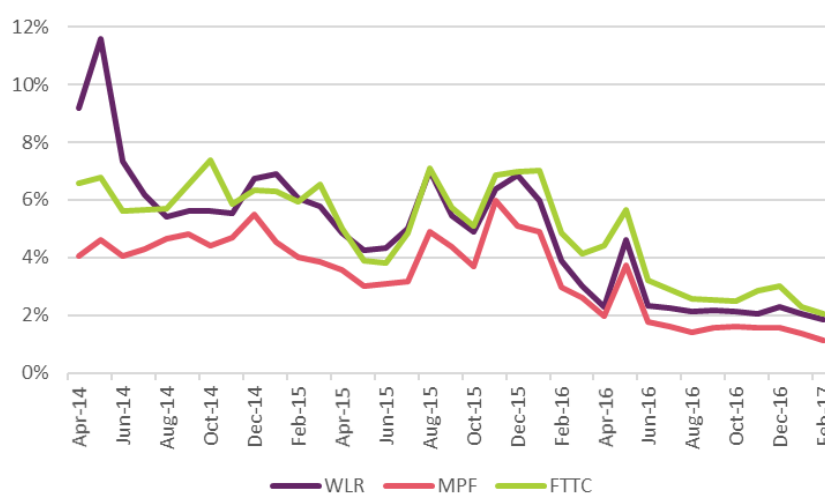
Table A6.48: Proportion of fault repairs exceeding the SLA impacted by MBORCs, excluding High Level MBORCs from the two most impacted regions

	2013/14	2014/15	2015/16
Total fault repairs	3,627,660	3,704,068	3,889,674
Total fault repairs impacted by MBORC	322,239	95,218	85,097
% of fault repairs impacted by MBORC	8.9%	2.6%	3.5%
Total fault repairs impacted by MBORC that missed SLA	164,581	40,438	39,907
% of fault repairs impacted by MBORC that missed SLA	51.1%	42.5%	46.9%
% of fault repairs that missed SLA impacted by MBORC	4.5%	1.1%	1.0%

Source: Ofcom analysis of BT data submitted in response to the 6th FAMR QoS information request of 3 March 2014, the 2nd QoS information request to BT of 3 May 2016, the 4th QoS information request to BT of 15 November 2016 and of BT data submitted in Openreach email to Ofcom dated March 2017

Missed repair appointments

A6.73 Our analysis indicates that, barring a rise in the second half of 2016, the proportions of WLR, MPF, and GEA-FTTC repair appointments missed by Openreach have remained on a general downward trend over the time period shown in the chart.

Figure A6.49: UK WLR, MPF and GEA-FTTC repair appointments missed by Openreach (%)

Source: Ofcom analysis of BT data submitted in response to the 1st QoS information request to BT of 4 January 2016 and updated 21 March 2017

Assessment

- A6.74 Our analysis in the 2014 FAMR indicated that Openreach's installation order and fault repair performance deteriorated between April 2008 and May 2013. The KPIs provided by Openreach since show that it has met the three QoS standards for WLR and MPF set by the 2014 FAMR in the first two years of the control. Also, service performance year-to-date for 2016/17 indicates that Openreach is set to meet the appointment availability and on time completion standards. Openreach is also currently achieving the modified repair standards at SMLs 1 and 2.
- A6.75 Average installation time for WLR, MPF and GEA-FTTC over the FAMR period has been fairly stable, although GEA-FTTP performance has varied more greatly. Similarly, average time to restore service for WLR, MPF and GEA-FTTC has held fairly constant since the FAMR with the exception of GEA-FTTP.²⁸⁶ ATTR for this service has more than doubled over the review period from around 22 days to 46 days.
- A6.76 With respect to the tails in engineer appointment availability, we observe that FADs offered beyond 12 working days have tended to peak in periods of bad weather and have then subsequently returned to more normal levels. This would suggest that Openreach is now better able to flex its resources to prioritise repairs over provisions when the fault intake is far greater than normal whilst at the same time ensuring that its provisioning queue does not get out of control. In relation to fault repairs, we observe that the average daily volumes of WLR and MPF repairs resolved beyond SLA are now lower than they were in August 2014. That said, the average daily volumes of late provisions have risen over the FAMR period, particularly for WLR.

²⁸⁶ As noted above, this may be due to the low volumes of GEA-FTTP relative to other services.

Annex 7

Resource implications of proposed performance standards

Introduction

- A7.1 In this annex we assess the impact on Openreach field engineering resources to achieve the QoS standards we propose for WLR, MPF and GEA.
- A7.2 In forming our assessment, we have relied primarily on a model developed in collaboration with our external advisors, Analysys Mason. The model (the Resource Performance Model) uses a high-level simulation of Openreach's field operations to estimate the proportion of fault repair and installation order activities that will meet specified service standards for a given level of resources.
- A7.3 Using this model we have calculated that the higher standards we have proposed for fault repair and installation orders (as set out in sections 5 and 6) would require an increase in Openreach resources of between 5.8% and 10.2% by 2020/21.
- A7.4 This annex is structured as follows:
- We first explain our approach to the assessment of the resource implications of our proposed quality standards. We explain why we developed the Resource Performance Model rather than use Openreach's model as in the 2014 FAMR.
 - We then examine the theoretical relationship between demand (i.e. work volumes), resources and performance in field service organisations such as Openreach. We then consider how, in practice, Openreach's operations relate to these theoretical models.
 - We then describe the operation of the Resource Performance Model and discuss its limitations.
 - We then describe the resource uplift estimates produced by the Resource Performance Model, including those we have used for the QoS standards we have proposed in Sections 5 and 6.
 - Lastly, we describe provisional resource uplift estimates from a new resource simulation model developed by Openreach (the 2017 Distribution Model). Openreach provided this summary information shortly before the publication of this document and so we have not reviewed the results in detail or examined the model. The results are presented below without comment and we have not taken them into account when formulating our proposals.

Our approach to estimating the resource and cost implications of performance improvements

In the 2014 FAMR we used a discrete event simulation model developed by Openreach to explore the resource implications of QoS improvements

- A7.5 In the June 2014 FAMR Statement, we used a resource simulation model developed by Openreach to explore the relationship between QoS performance and resources for Openreach's main services (MPF, WLR, SMPF and GEA). The Openreach model (the 2013 Distribution Model) is of a type known as a 'discrete event simulation' that is often used to model the operation of queue-based processes. With this type of model, the arrival, queuing and processing of individual events (in this case faults and installation orders) are modelled using a time sequence simulation so that the performance characteristics and resource requirements of the process can be assessed.
- A7.6 During the 2014 Fixed Access Market Review the 2013 Distribution Model and its resource estimates for a range of performance improvements were subject to detailed scrutiny by us and by external advisors Analysys Mason who we commissioned to review the model. We also took account of a broad range of stakeholder views.²⁸⁷ We concluded that although the model had certain limitations, some of its outputs could be used to assess the resource requirements, and therefore cost increments, associated with the performance improvement necessary to comply with the minimum standards we proposed and subsequently imposed on BT.

We intended to use an Openreach resource simulation model again in this review

- A7.7 We have again considered how best to assess the resource and cost implications of the QoS improvements we are considering for Openreach's voice and broadband services as part of this review. Notwithstanding the identified limitations in the 2013 Distribution Model, we considered that a resource simulation model could be an effective tool to explore this relationship because such models can simulate the non-linear relationship between performance and resources. We also considered that Openreach might be best placed to undertake such modelling as it should be better able to ensure that the model reflects the operational processes being modelled.
- A7.8 In May 2016 we asked Openreach whether it could provide estimates for further improvements in QoS performance and discussed with them how best the performance improvements might be modelled given the limitations identified with the 2013 Distribution Model.²⁸⁸ Openreach agreed to provide resource estimates and informed us that it had already commissioned EY to develop its resource simulation model, partly in anticipation of our request. At that time, Openreach expected that its modelling results would be available during the summer of 2016.
- A7.9 In June 2016, Openreach informed us that two models were being developed:

²⁸⁷ Ofcom, *Fixed Access Market Review- wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30, Statement*, 26 June 2014, https://www.ofcom.org.uk/_data/assets/pdf_file/0026/78812/annexes.pdf.

²⁸⁸ Meeting with Openreach 19 May 2016.

- A replica of the 2013 Distribution Model transferred to a new software platform (using the R programming language) that would enable the resource simulations to run much more quickly. The new model (the 2017 Distribution Model) would have an option to model performance at more granular level (the 56 Senior Operations Manager (SOM) area as well as the 9 General Manager (GM) regions) but would otherwise be identical to the 2013 Distribution Model i.e. it would the same simulation logic and should therefore produce comparable results to the 2013 Distribution Model.
 - A new model (the 2017 Allocation Model), implemented using the Python programming language, that uses the allocation approach to discrete event simulation.²⁸⁹
- A7.10 The essential difference between the two models relates to the modelling approach. With the allocation approach the simulation is used to estimate the performance that can be achieved for a given resource level for a specified pattern of jobs (i.e. repairs and installations), whereas for the distribution approach, the simulation is used to estimate the resource levels required to deliver a given performance for the specified pattern of jobs.
- A7.11 Openreach subsequently informed us that it expected the 2017 Allocation Model to provide more accurate estimates of resource / performance estimates because it will capture a broader range of factors that impact performance from both a demand and a supply side perspective.²⁹⁰
- A7.12 The development of the models took longer than Openreach originally expected. In October 2016, Openreach informed us that the delivery of the results would be delayed until early in 2017. In the event, Openreach did not provide us with either model prior to publication of this consultation but did provide sample outputs from the 2017 Distribution Model for a range of performance improvements in February 2017. We present a summary of these results later in this annex. However, we have not yet examined the results in detail, nor have we had an opportunity to review the 2017 Distribution Model. We therefore treat these results with some caution and have not taken them into consideration when formulating our proposals.

Openreach has not completed its resource simulation models so we have developed our own simulation model

- A7.13 Because obtaining resource estimates from Openreach was delayed, we decided to develop our own model to inform our consultation proposals for QoS improvements. We decided to enhance a resource model that we had developed internally, rather than construct a full discrete event simulation model. We considered that such a model could produce reliable resource estimates and would be significantly less time consuming to produce. To this end we commissioned Analysys Mason to further enhance the high-level resource simulation model we developed in house and add the additional functionality required to model the resource implications of the QoS improvements we were considering for this consultation. We have used the outputs of this model to inform our consultation proposals.

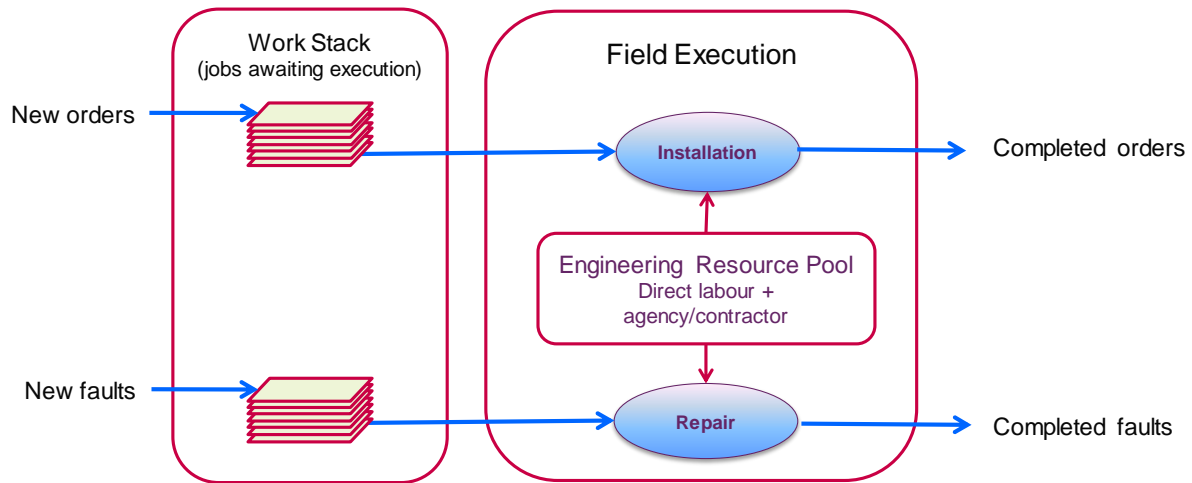
²⁸⁹ Meeting with Openreach and EY 22 June 2016.

²⁹⁰ Meeting with Openreach 10 January 2017.

The relationship between demand, resources and performance

A7.14 Figure A7.1 shows a simplified process model of Openreach's field operations

Figure A7.1 Simplified process model for Openreach



A7.15 As new installation orders and faults arrive, they are placed in a work stack awaiting execution. Work is undertaken in order of arrival and thus installation orders and faults are taken from the bottom of the work stack for field execution (subject to necessary prioritisation e.g. by service level).

A7.16 Appointed installation orders are controlled by means of an appointment book, which is populated with appointment slots that reflect the volume of field resources that will be made available each day for installation work. The orders are executed on the appointment date that they have been allocated. In normal circumstances, sufficient resources are made available to meet provision demand. When fault rates are high, the number of appointment slots can be reduced and resources diverted to repair work and appointment lead times are allowed to extend.

A7.17 The primary determinant of the process performance is the balance between the volume of work to be undertaken and the resources available to undertake it.

A7.18 When sufficient resources are available, it should be possible to achieve a high quality of service (i.e. to complete the majority of fault repairs and orders successfully within the agreed timescales). In practice, a small minority of faults and installation orders will not be completed successfully for example because of errors or because some jobs are too complex to complete within the agreed timescales.

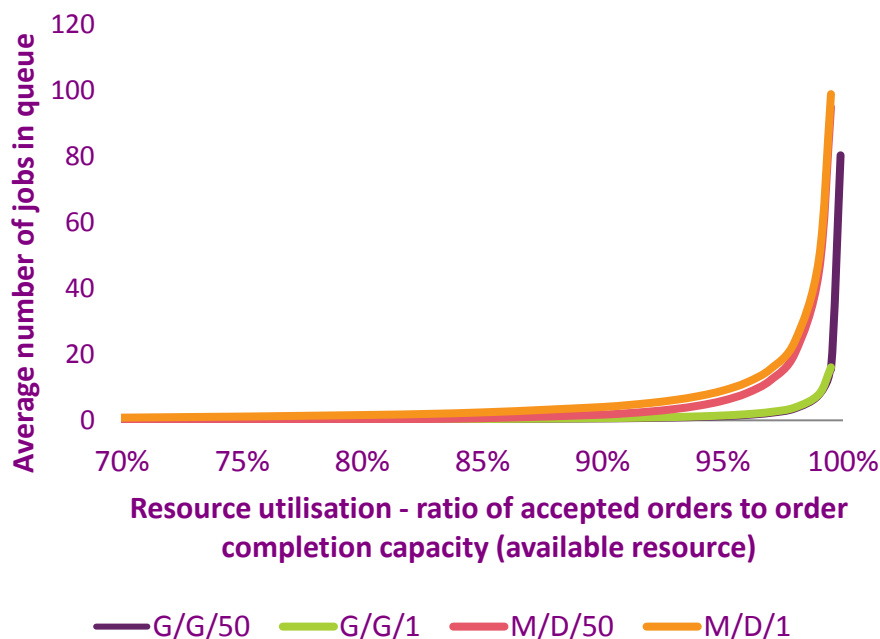
A7.19 If work volumes exceed the resources available, then performance will inevitably suffer. For example, faults will not all be repaired within the target time and installation order lead times will be extended.

A7.20 A specific feature of such processes is that after a period of excess demand, performance will not be fully restored until the backlog of work in the work stack has been cleared. While the backlog exists, all incoming work will spend longer than normal in the work stack waiting for resources to become available and consequently performance is impaired. This feature means that performance is highly sensitive to the level of resources available to meet demand. In particular performance is sensitive to resources in the following ways:

- Sensitivity to peaks in demand: the time taken to clear a backlog of work generated by a short-term peak in demand will depend on the amount of spare capacity available once demand has fallen back to normal levels. For example, if an organisation is presented with a peak of work 20% above normal for one week after which volumes return to normal, the backlog could be cleared and performance restored in approximately one additional week if the organisation has 10% spare capacity at normal volumes. However, if it has only 2% spare capacity the backlog would take approximately five weeks to clear. In the extreme, if the organisation has no spare capacity, performance would not be restored unless demand falls below normal.
- Cumulative impact of small resource shortfalls: a small shortfall in resources relative to demand that persists over an extended period will cause the work stack to steadily increase and will consequently have a large impact on performance.

A7.21 Operational processes of this type are known generically as queuing models and have been subject to detailed theoretical study. The sensitivity of performance to the level of resources is evident in theoretical resource utilisation curves for such queuing models. Figure A7.2 below shows the theoretical relationship between resource utilisation and the average number of jobs queued for a selection of queuing models.

Figure A7.2: Theoretical performance for a sample of queuing models²⁹¹



²⁹¹ Figure A7.2 portrays the theoretical performance for queuing systems consisting of a single queue served by one or 50 servers ($k=1$ or 50). The G/G/k curves assume a generalised probability distribution for both inter-arrival time (the time between jobs arriving) and service time (the time taken to execute jobs). In the G/G/k case the distribution of queue length and associated statistics (mean, variance, etc.) are insensitive to the probability distribution of the inter-arrival time and service time. The curves are theoretical approximations as exact solutions are not available in most cases (see Dennis E. Blumenfeld, Operations Research Calculations Handbook, second edition, CRC Press, 2012). The G/G/k curves are for an arrival coefficient of variation (CV) of 0.4 and a service CV of 0.05,

Source: Ofcom

- A7.22 Figure A7.2 shows that the number of jobs queued rises sharply as resource utilisation passes a certain threshold (e.g. beyond about 95% in the examples in Figure A7.2). The number of jobs in the queue also has a direct bearing on cycle time (i.e. the overall elapsed time from the arrival of a work item to when it is completed) and therefore performance against cycle time SLAs.²⁹²
- A7.23 Clearly, at high levels of resource utilisation the queue length (and therefore performance) will be very sensitive to small variations in resource utilisation that might arise because of variations in work volumes and resource levels.
- A7.24 In the 2014 FAMR we concluded that a small increase in Openreach resource would produce a significant improvement in Openreach performance because we thought Openreach were operating very close to or on the steep part of the curve in Figure A7.2. Openreach has improved its performance since the 2014 FAMR Statement was published.

Practical considerations in analysing Openreach's performance

- A7.25 In practice, Openreach operates many work queues for installation orders and faults (reflecting the geographic areas and range of differently skilled engineers required). The observed national performance reflects the overall average achievement for the full group of queues rather than an individual queue as in the theoretical example above.
- A7.26 Further, the demand patterns faced by Openreach are also more complex and vary from day to day as well as seasonally and from region to region.
- A7.27 Openreach also has a significant amount of flexibility in managing its resources to meet demand. For example:
- Periods of low demand can be used to reduce or eliminate backlogs built up in periods of high demand provided resources are not reduced in line with the demand reductions. Sustaining resource levels can also be used to keep installation order and fault repair lead times low under normal circumstances to make performance more resilient to peaks of demand.
 - Preventative maintenance work can be undertaken in periods of low demand to keep staff that are not immediately required for installation order and fault repair work to keep staff fully utilised. Preventative maintenance should reduce fault volumes.
 - The level of resources available for fault repair can be increased during periods of high demand by:
 - redeploying staff from preventative maintenance activities;

values derived from the resource and volume data obtained under our statutory powers. Coefficient of variation is the standard deviation divided by the mean of the sample data. The M/D/k curves assume an exponential inter arrival time distribution (Poisson arrival process) and a constant service time.

²⁹² In a single server scenario, a queue length of 16 jobs indicates a cycle time equivalent to the time taken by the server to complete 16 jobs in the queue plus the time taken to service the job in the server (e.g. if the server completes 4 jobs per day, the cycle time would be 4.25 days to complete the 17 jobs).

- using overtime;
- by moving staff from areas with low demand to areas with high demand;
- temporarily extending installation order appointment lead times within the range permitted by the SLA so that it is possible to redeploy field staff to fault repair activities;
- using contractors; and
- recruiting additional staff.

A7.28 Given this flexibility we would expect performance to be somewhat more resilient to variations in demand than the theoretical curve presented in Figure A7.2. We would nevertheless expect Openreach's performance to exhibit the generic characteristics of queuing models. Particularly, we would expect:

- the balance between demand and resources to be the primary determinant of Openreach's installation order and fault repair performance;
- Openreach's performance to become less resilient to peaks in demand at high levels of resource utilisation;
- a small shortfall of resources compared with demand to lead to a large drop in performance, particularly if the shortfall persisted for an extended period; and
- a small increase in resource of the order of 5 to 10% to lead to a significant improvement in performance in cases where performance has been impaired by resource shortages.

Description of the Resource Performance Model

A7.29 Below we describe the Resource Performance Model. Analysys Mason have provided a more detailed description of the model as well as an overview of the original Ofcom model. Further details on both of these models is set out in their report which is published alongside this consultation.²⁹³

Publication of the model

A7.30 We plan to make the Resource Performance Model available on request in the near future once we have completed our review of the model to (i) ensure it does not contain any confidential data; (ii) refine the operating instructions and (iii) define the computing environment required to run it.

A7.31 The model is written in the Python computer programming language and requires a Python interpreter and associated tools to run the model. It was developed using the Spyder integrated development environment (IDE) and associated Python interpreter which can be obtained, for example, as part of the Anaconda Python package (www.continuum.io/downloads). We suggest that the model is run using

²⁹³ See Overview of the Quality-of-Service Model and its outputs for WLR/LLU Charge Control 2017 (Analysys Mason Report) for more details.
https://www.ofcom.org.uk/_data/assets/pdf_file/0034/99646/Analysys-Mason-report.pdf.

the same environment. Input and output files are in “csv” format which requires Excel or similar for pre and post processing.

- A7.32 Processing speed depends on the computer hardware used. Each run (5 to 11 resource levels) typically takes one to two hours and may require more than 10Gbyte of memory (RAM). Some runs may require more than 32Gbyte where the queue lengths become very long due to low resource levels relative to the workload. More than 50 hours of computation will be required to cover all the options reported in this Annex.

Purpose

- A7.33 The Resource Performance Model is designed to estimate the increases in field engineering resources required to deliver specified improvements to installation order and repair QoS performance for Openreach's WLR, MPF, SMPF and GEA services. Other functions associated with installation and repair are not modelled e.g. workforce management/control, fault diagnosis, exchange jumpering and repair of exchange equipment.

Model inputs

- A7.34 The main input to the model is a daily summary of installation order and fault volumes derived from a dataset of faults and installation orders obtained from Openreach under section 135 of the Act.
- A7.35 There are also certain ancillary inputs most notably the major and minor failure assumptions discussed below.

Simulation approach

- A7.36 The Resource Performance Model provides a high-level simulation of Openreach's installation order and repair activities. Unlike discrete event simulation models, such as the 2013 Distribution Model, which simulate the execution of individual provision and repair jobs, the Resource Performance Model simulates the execution of jobs in larger groups or batches, specifically the daily arrivals of new installation orders, SML1 faults and SML2 faults in each of Openreach's 56 Senior Operations Manager areas in Great Britain.²⁹⁴ The model is implemented as a programme using the Python 3 programming language.
- A7.37 The simulation is best described as a book keeping exercise in which the evolution of jobs is modelled from arrival to completion. The main elements of the sequence are as follows:
- Daily 'arrivals' of jobs are divided into batches according to job type (provision, and fault repair SML1 and SML2) and then added to the back of a queue of outstanding work of the corresponding job type and SOM region.
 - Each job in the batch is time-stamped with the batch arrival time. Progress of each job is subsequently tracked individually to completion.

²⁹⁴ Northern Ireland is excluded by the Openreach dataset of orders and faults had less detail than elsewhere in the UK and could not therefore be modelled.

- The available field resources (an input to the model) are allocated to each type of job according either to a fixed ratio specified as an input or using a resource balancing algorithm designed to balance the performance by job type.
- Four times daily, jobs are taken from the bottom of each queue and allocated to the available field resources allocated to the queue (i.e. it is assumed that field technicians can on average undertake four installation or fault repair jobs per day).
- Jobs that are not successfully completed by field technicians are modelled by reference to a set of 'glass ceiling' input parameters specifying the proportion of jobs that fail during field execution (see below for further explanation).

A7.38 The model includes various functional elements to simulate Openreach's operational processes including:

- Functionality to model the operational limits of field engineering performance (the so called 'glass ceiling' limitations) as discussed in more detail below.
- Functionality to model the allocation of finite common resources to jobs (i.e. job scheduling) including:
 - Resource algorithms to simulate the use of a common resource pool to serve both installation and repair jobs.
 - Sharing of resources with adjacent SOM regions in periods of high demand and with non-adjacent SOM regions in periods of exceptionally high demand (e.g. exceptionally high fault volumes after major storms). The inefficiencies arising such as additional travel time are also modelled.

A7.39 We discuss the major and minor fail parameters in more detail below.

Modelling of the operational limits to performance (the 'glass ceiling' limitations)

A7.40 A small proportion of installation orders and fault repairs fail at the execution stage for reasons other than lack of resources to undertake the work. Openreach refers to these failures as 'on-the-day' failures reflecting the fact that most failures relate to something that goes wrong while field technicians are working on jobs. Openreach considers that these failures represent a practical upper limit or 'glass ceiling' to QoS performance.

A7.41 As noted above, the Resource Performance Model includes functionality to model these operational constraints. This is through parameters that specify the level of on-the-day failures and how they are handled as follows:²⁹⁵

- 'Minor fail' jobs representing those jobs that are not completed successfully on the first attempt but which can be successfully completed on a second attempt after a short delay. If there is sufficient time and resources, the model allows fault

²⁹⁵ See Overview of the Quality-of-Service Model and its outputs for WLR/LLU Charge Control 2017 (Analysys Mason Report) for further details concerning the provision and repair versions of the glass ceiling major and minor fails, including the values modelled.

https://www.ofcom.org.uk/_data/assets/pdf_file/0034/99646/Analysys-Mason-report.pdf.

repair minor fails to be completed successfully within the SLA on the second attempt.²⁹⁶

- ‘Major fail’ jobs representing the small proportion of jobs that are not completed successfully on the first attempt and which will incur a longer delay, potentially several days or even weeks to complete. The model assumes that major fail jobs are delayed for five days and will not therefore be completed within the relevant SLA.

A7.42 As we discuss in Section 5 we obtained information from Openreach about the incidence of these ‘on-the-day’ failures (i.e. the level of the glass ceiling) for installation orders and fault repair.²⁹⁷ This failure analysis categorises failures according to the reasons for the failure. We also asked Openreach to explain what scope there may be to raise the glass ceiling by reducing the incidence of such failures. While Openreach acknowledges that there is scope to make improvements it has not provided us with any information about the improvements that could be achieved. We therefore propose to rely on our own estimates concerning the scope for improvements.

A7.43 The major and minor fail values used in the model were derived from Openreach’s failure analysis information. We used a two-step process:

- We first classified each failure category according to how quickly Openreach could reasonably be expected to take corrective action. Examples include jobs that fail because a technician required assistance or specialist tools (such as an elevating platform) to complete a job. We classified failures due to minor problems that Openreach could reasonably be expected to address the following day as minor fails. We classified failures due to problems that might take longer to address as major fails. Examples include failures due to line plant problems and major service outages.
- We then made assumptions about the scope for Openreach to reduce the incidence of on-the-day failures as discussed in more detail below.

A7.44 Table A7.3 below shows the assumptions used in the Resource Performance Model to produce the resource estimates for QoS improvements. It is worth noting that the failures set out below are on-the-day failures and not necessarily failures against the SLA. When considering Openreach’s operational limitations for its performance against repair SLAs (see Section 5), we take into account that some on-the-day failures may not actually result in failure against the SLA.

²⁹⁶ Comparable functionality is not implemented for installation orders because installation orders must be completed on the appointment date to meet the CDD SLA.

²⁹⁷ Glass Ceiling Analysis, Openreach presentation to Ofcom 2 November 2016 and Openreach response to service related questions in Ofcom’s consultation documents, 30 September 2013 https://www.ofcom.org.uk/_data/assets/pdf_file/0026/81557/openreach_-_quality_of_service.pdf.

Table A7.3 On the day glass ceiling assumptions used to produce resource estimates

Failure categorisation	% of jobs failing at first attempt
Installation order major fails	1.4%
Installation order minor fails	3.6%
Fault repair major fails	3%
Fault repair minor fails	5% and 3%

Source: Ofcom

A7.45 The basis for these assumptions is as follows:

- Major fails: we have assumed that it would be comparatively difficult for Openreach to reduce the incidence of both fault repair and installation order major fails. For modelling purposes, we have therefore set the major fail percentages to reflect the current incidence of major fails according to our classification.
- Installation order minor fails: we have assumed that Openreach would be able to reduce the level of minor failures from 6% to 3.6% taking the overall incidence of installation order fails to 5% in line with Openreach's public commitment to increase performance against the Contractual Delivery Date (CDD) SLA to 95%.²⁹⁸
- Fault repair minor fails: as we have discussed in more detail in section 5 we consider there should be scope for Openreach to reduce the incidence of fault repair minor fails. We have therefore produced resource estimates using two different assumptions about the level of fault repair minor fails to explore the sensitivity of the resource estimates to the incidence of this type of failure:
 - an incidence of 5% reflecting the current incidence of fault repair minor fails; and
 - a lower incidence of 3% representing potential process improvements that Openreach might make to reduce this type of failure.

Model outputs

- A7.46 The main output of the model is the QoS performance that can be achieved with specified levels of resources. Three QoS performance parameters are modelled: the proportion of fault repairs completed within the SML1 and SML2 SLAs, reported separately; and the proportion of orders completed within specified target for the FAD.
- A7.47 As with the 2013 Distribution Model, it is assumed that the FAD offered is always taken (although in practice this is often not the case). Consequently, the modelled FAD performance is synonymous with the performance against CDD. Thus, for example, a model output indicating that 80% of orders are offered a FAD within ten days also indicates that 80% of orders were completed by the CDD.
- A7.48 To enable the calculation of the resources required to achieve a given level of QoS performance, the model produces outputs for a range of resource levels. Where

²⁹⁸ See Section 6.

necessary outputs are derived by interpolating between appropriate pairs of performance-resource results generated by the model.

- A7.49 Performance is modelled at the SOM level to allow for more granular estimation of the resource requirements than in the 2013 Distribution Model. Performance is however, assessed for the nine General Manager (GM) regions (i.e. the aggregate performance of the consistent SOM areas).²⁹⁹

Limitations of the model

- A7.50 The Resource Performance Model is necessarily a high-level approximation of Openreach's field engineering activities for installation orders and fault repair. In this section we briefly describe these limitations and consider how they might affect how well the model represents Openreach's actual operations. We have taken these limitations into account in formulating our proposals.

- Job queue size: it is assumed that each job type is held in a single queue per SOM area and that all field engineering resources can tackle outstanding work. In practice, it is likely that Openreach ordinarily allocates resources based on smaller geographic areas. Large queues could have the effect of averaging out local variations that might lead to resource failures (e.g. the volume of available resources may match the volume of work to be undertaken, but in practice those resources may be too far away to undertake it).
- Job duration: a constant duration, 2.5 hours, is assumed for every job. In practice job durations will vary. Not taking this into account could overlook variations that could on some days have a material impact on the overall number of jobs that can be completed during the day.
- Skill level of technicians: the model assumes that all technicians can undertake all types of job. In practice, not all technicians can undertake all types of work, placing an additional constraint on Openreach's resources. The extent to which this simplification might affect the model results is unclear.
- Sub-optimal allocation of resources between SOM regions: the model assumes a fixed split of resources between SOM regions based on a weighted sum of the SOM region's fault rate and the size of the installed base as of 1 April 2011. It is possible that both have since changed thereby making the resource allocation mechanism sub-optimal.
- MBORC: jobs subject to MBORC declarations are not identified in the input dataset. The modelled outputs are therefore based on a somewhat larger pool of jobs than actually contribute to the QoS performance measures. It is unclear whether this simplification would materially affect the resource estimates for QoS improvements.
- Allocation of resources between repair and provision: the resource allocation algorithm may not always lead to optimal performance against the QoS performance measures because allocations are made based on the total lengths of the queues for each job type. This mechanism does not for example take account of the volume of SML1 repair activities that would need to be completed on that day to fulfil the SLA. This simplification could therefore cause the model to

²⁹⁹ Each of the 56 SOM regions modelled lies within one of the 9 GM regions.

overestimate the resource increase required for a particular increase in performance.

- Glass ceiling assumptions: we have made certain simplifying assumptions concerning the handling of glass ceiling jobs (i.e. jobs that are not successfully completed on first attempt for reasons other than lack of resources). As discussed above, we have divided these failures into two groups: minor fail type jobs (jobs that are reissued for a second attempt the day following the first attempt) and major fail type jobs (jobs that are delayed for 5 days before they are reissued). While these groupings draw on our analysis of Openreach's glass ceiling failure analysis, they may not fully replicate the range of behaviours that occur and resources used. Moreover, as we discuss below, the model outputs are sensitive to the level at which the glass ceiling parameters are set.

A7.51 By way of context we note that some of the limitations discussed above were also present in the 2013 Distribution Model. In particular:

- Job queue size: larger queues were used, modelling at the GM level (9 regions) rather than SOM level (56 areas).
- Job durations: fixed job durations were also used.
- Skill level of technicians: technician skill levels were modelled, however we found that the algorithm used would lead to a systematic overestimation of resources.
- MBORC: jobs subject to MBORC declarations were included in the resource estimates.

A7.52 We also note that Analysys Mason have discussed most of the limitations introduced above in Section 4.2 of their report.³⁰⁰ They concluded that overall the model provides a reasonable representation of the resourcing challenges faced by Openreach.

Replication of resource uplift estimates for the quality standards imposed in the 2014 FAMR Statement

A7.53 As an initial test of the Resource Performance Model we asked Analysys Mason to produce resource estimates for the performance improvements imposed on Openreach in the 2014 FAMR Statement. The purpose was to test whether the Analysys Mason model could replicate the results we relied on in 2014 FAMR reasonably closely.

A7.54 Table A7.4 below lists the key parameters we relied on in 2014 FAMR when setting quality standards. The table shows the base case we relied on at that time (performance before the minimum standard was imposed) and the final case (the minimum level of performance imposed by the standards we set on 2014) both for the chosen reference year (2011/12). It then displays the estimated resource uplift as calculated using the Resource Performance Model.

³⁰⁰ See Overview of the Quality-of-Service Model and its outputs for WLR/LLU Charge Control 2017 (Analysys Mason Report) for more details.
https://www.ofcom.org.uk/_data/assets/pdf_file/0034/99646/Analysys-Mason-report.pdf.

Table A7.4: Resource Performance Model outputs for 2011/12 baseline showing additional resources required to raise performance to the minimum standards imposed in the 2014 FAMR Statement

	Base Case 2011/12 performance	Final Case Minimum standard
Fault repair service mix (SML1 / SML2)	Actual (44/56)	Actual (44/56)
Appointment availability SLA (FAD) (working days)	12	12
% Orders completed within FAD target	65%	80%
Provision by Contractual Delivery Date	90%	90%
Repair performance within SLA for SML1	77.8%	80%
Repair performance within SLA for SML2	77.8%	80%
% Resource uplift	-	4.7%

Source: *Analysys Mason Report*³⁰¹

A7.55 As Table A7.4 shows, the resource uplift calculated using The Resource Performance Model is 4.7%. We consider this to be a reasonable approximation to the 3.9% uplift we reported in the 2014 FAMR Statement, noting that the modelling method of the Resource Performance Model is very different to the 2013 Distribution Model.

Fault repair dispatch patterns

A7.56 As discussed above, the Resource Performance Model allows fault repairs classified as minor fails to be reissued and successfully completed the following day if sufficient resources are available. The distribution pattern of fault repairs therefore has the potential to influence performance. If a greater proportion of repair jobs are initially dispatched to field technicians on the day of receipt, or on the case of SML1 faults on the day after receipt, the proportion of minor fails that are successfully completed within the SLA on the second attempt will increase. We therefore compared the distribution pattern for fault repair jobs in the Resource Performance Model with Openreach's fault distribution patterns.

A7.57 Table A7.5 compares the fault distribution pattern (i.e. proportion of repair tasks attempted pre SLA and on the final day required to meet the SLA) for the Resource Performance Model with Openreach's actual fault distribution pattern. We observe that the Resource Performance Model produces results that are very similar to what happens in practice. We therefore conclude that resource estimates produced by the Resource Performance Model are unlikely to be unduly influenced by differences in the assumptions we make about the pattern of fault repair dispatch and Openreach's practice in the field.

³⁰¹ Overview of the Quality-of-Service Model and its outputs for WLR/LLU Charge Control 2017. https://www.ofcom.org.uk/_data/assets/pdf_file/0034/99646/Analysys-Mason-report.pdf.

Table A7.5: Comparison of Openreach fault repair distribution patterns with those generated by the Resource Performance Model

Fault dispatch date relative to SLA >		2 days before SLA target	Day before SLA target	SLA target	After SLA target
Openreach	SML1	14%	37%	36%	13%
	SML2	-	20%	63%	17%
Resource Performance Model	SML1	8%	36%	46%	10%
	SML2	-	17%	77%	6%

Source: Openreach³⁰² and Resource Performance Model

Resource uplift estimates for QoS improvements

- A7.58 The model is necessarily a high-level approximation of the Openreach resource allocation process. Although we acknowledge that there is scope for further refinement of the model, we consider that it is sufficiently representative and robust for consultation. We look forward to stakeholder comments on the accuracy of the model, especially responses that contain evidence that could be used to improve the model.
- A7.59 Tables A7.6 and A7.7 present resource uplift estimates for selected fault repair and installation order QoS improvements considered in Sections 5 and 6 respectively. The resource uplift estimates are measured against a base case of Openreach's performance in 2015/16 which is the base year for our charge controls. Table A7.6 and Table A7.7 use the 5% and 3% fault repair minor fail assumptions respectively. Further model outputs using 2014/15 base year performance and sensitivity tests are presented in Analysys Mason's report.³⁰³

Table A7.6: Estimated resource uplift required to achieve selected QoS improvements using 2015/16 base year for 5% repair minor fails in glass ceiling

	Base case	Selected QoS improvements			
SML1 / SML2 mix	Actual (44/56)	Actual (44/56)	50/50		
FAD (working days)	12	10	10		
% Orders offered FAD date	80%	80%	90%		
Provision on CDD	90%	95%	95%		
Repair within SLA for SML1	80%	80%	90%	93%	93%
Repair within SLA for SML2	80%	80%	90%	90%	93%
% Resource uplift	-	1.1%	4.3%	4.3%	10.2%

³⁰² Fault distribution pattern information supplied by Openreach for the period 2 September 2016 to 25 November 2016. The values portrayed in the table represent the simple average of the WLR and MPF numbers that Openreach supplied. No allowance has been made for the relative volumes of repairs for the two services.

³⁰³ Overview of the Quality-of-Service Model and its outputs for WLR/LLU Charge Control 2017
https://www.ofcom.org.uk/_data/assets/pdf_file/0034/99646/Analysys-Mason-report.pdf.

Source: Ofcom

Table A7.7: Estimated resource uplift required to achieve selected QoS improvements using 2015/16 base year for 3% minor fails in glass ceiling

	Base case	Selected QoS Improvements			
SML1 / SML2 mix	Actual (44/56)	Actual (44/56)	50/50		
FAD (working days)	12	10	10		
% Orders offered FAD date	80%	80%	90%		
Provision by CDD	90%	95%	95%		
Repair within SLA for SML1	80%	80%	90%	90%	93%
Repair within SLA for SML2	80%	80%	90%	90%	93%
% Resource uplift	-	0.6%	2.8%	3.2%	5.8%

Source: Ofcom

A7.60 Tables A7.6 and 7.7 show that the resource uplift estimates are sensitive to the level at which the fault repair glass ceiling is set (i.e. sensitive to the choice of fault repair minor fail value).

Resource uplift estimates for proposed QoS standards

A7.61 Table A7.8 presents our resource uplift estimates for the QoS standards that we have proposed for fault repair and installation orders in Sections 5 and 6 respectively for each of the three years of the proposed charge control (2018/19 to 2020/21). The base year and year 3 resource uplift estimates are based on outputs from the Resource Performance Model. The resource uplift estimates for year 1 and year 2 have been derived using a linear extrapolation between the base year and year 3 figures. As previously discussed CDD performance is not directly modelled in the Resource Performance Model.

A7.62 The upper bound of our estimates is the 5% minor fail model outputs (which reflects Openreach's current glass ceiling), and the lower bound is the 3% minor fail model outputs (which assumes an improvement in Openreach's glass ceiling). Our proposal for the charge controls is the mid-point between these bounds.

Table A7.8: Resource uplift estimates for the proposed QoS Standards (excluding MBORC)

	Base Year (2015/16)	Year 1 (2018/19)	Year 2 (2019/2020)	Year 3 (2020/2021)
SML1 / SML2 mix	Actual	50 / 50	50 / 50	50 / 50
Fault repair minor fail	3% to 5%			3% to 5%
FAD (working days)	12	12	12	10
% Orders offered date (FAD)	80%	90%	90%	90%
Provision by Committed Date	90%	92%	92%	95%
Repair within SLA (SML1 / SML2)	80% / 80%	83% / 83%	90% / 90%	93% / 93%
% Resource uplift range	-	1.9% - 3.4%	3.8% - 6.8%	5.8% - 10.2%
Proposed values for charge control model		2.7%	5.3%	8.0%

Source: Ofcom

SML mix factors for charge control model

- A7.63 In the summer of 2016 there were significant changes in the mix of SML1 and SML2 faults for WLR and MPF services because of product migrations by several large telecoms providers. As we are using 2015/16 as the base year for our charge controls we intend to make an adjustment to reflect the full annual impact of these changes. To do this we need to establish how the resource requirements vary by fault repair service maintenance level. To facilitate these calculations, we have used the Resource Performance Model to derive service maintenance level ‘mix factors’.
- A7.64 The mix factors have been derived by modelling selected mixes of SML1 and SML2 faults.³⁰⁴ The SML factors derived are the slope of the linear fit trend lines for the these results.
- A7.65 Two SML mix factors are derived from the Resource Performance Model results and are presented in Table A7.9 below, the first reflecting Openreach’s performance in the base year (2015/16) and the second reflecting the proposed QoS standards. A range is established using the same approach as that described above for the resource uplift, i.e. using the 5% and 3% minor fail values. The proposed SML factors for the charge control model are taken as the mid-point in the range.

³⁰⁴ Five SML1/SML2 mixes were modelled – 100%/0%, 60%/40%, 50%/50%, 40%/60% and 0%/100%.

Table A7.9: Service maintenance level mix factors for charge control model

	Percentage change in resource for each percent change in SML mix		
	(3% minor fail)	(5% minor fail)	Proposed value
Mix factors for 2015/16 performance	0.0231	0.0265	0.0248
Mix factors at proposed QoS standards	0.0579	0.0767	0.0673

Source: Ofcom

A7.66 These mix factors allow us to provide separate resource uplifts for the two services for which we propose to impose a charge control, MPF at SML1 and GEA -FTTC (40/10) at SML2:

- MPF SML1: 8% resource uplift at 50/50 mix (Table A7.8) minus 50 percentage points * 0.0673 = 4.6%
- GEA-FTTC (40/10) SML2: 8% resource uplift at 50/50 mix (Table A7.8) plus 50 percentage points * 0.0673 = 11.4%

Results from our charge control models

A7.67 The impact on regulated charges from our proposed standards are set out below. We have first implemented the impact of reduced fault rates compared to the base year, as set out in Annex 5, and then the resource uplifts from our foregoing analysis in this Annex.

Table A7.10: Outputs from charge control models for QoS proposals

	Impact on charge controls (£s per annum)		
	Fault Reduction	Higher Standards	Total
MPF SML1	£(2.21)	£0.62	£(1.59)
FTTC SML2	£(0.54)	£0.36	£(0.18)

Provisional results from Openreach's 2017 Distribution Model

A7.68 In this sub-section, we provide a summary of the provisional results of the 2017 Distribution Model. As previously noted, we have not reviewed these results in detail because we have not been provided with the model to review. We therefore present these results for information only without further comment or analysis.

A7.69 Openreach generated two sets of results with the base year level set at 2015/16. The first estimated the minimum resource uplifts required to achieve improvements in performance levels at the GM area level while the second estimated resource uplifts at the SOM area level.

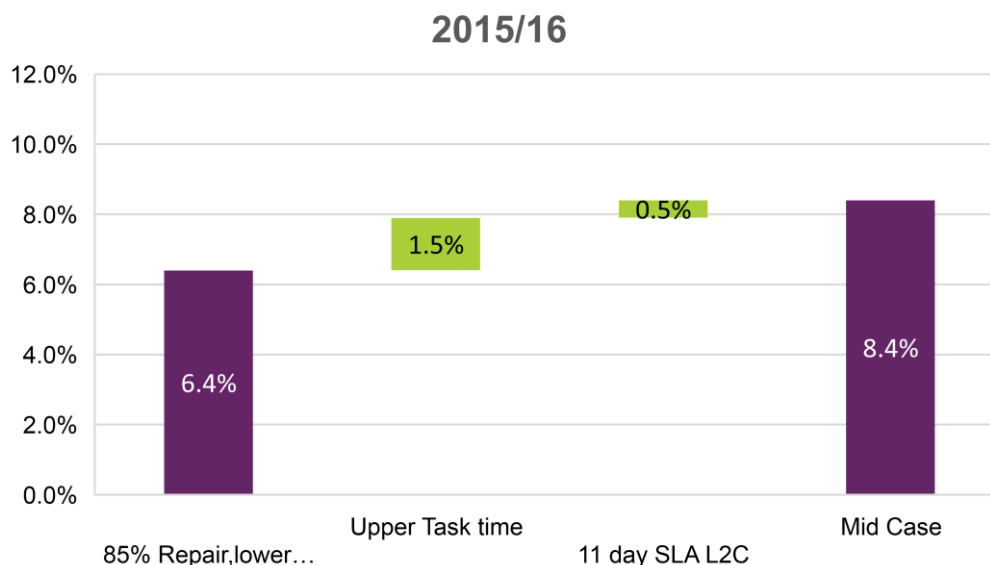
- A7.70 Openreach first estimated the minimum³⁰⁵ resource uplift required to achieve an 85% repair quality standard at the GM area level (before MBORC allowance) with provision performance held at base year levels³⁰⁶. Openreach then made further assumptions in generating its results:
- i) Increased task time: Openreach said that analysis it has undertaken suggests that task times increase as performance levels increase. For example, engineers will require more travel time to reach priority jobs in unfamiliar areas. Openreach considers that task time uplift ranges from 1.5%-3.0% and 3.0%- 6.0% for installation orders and fault repairs respectively.
 - ii) Adjustments in actual performance level modelled: To ensure Openreach exceeds the actual minimum target, it models a few performance a few percentage points above the minimum targets. Openreach modelled a target level of 87% even though the actual target assumed in the model was 85%. Based on this and the uplift ranges for installation orders and fault repair in (i) above, it applied a cost uplift of 1.5%.
 - iii) 11 day installation lead time: The model also assumes an installation lead time improvement (and therefore completion) from 12 to 11 working days. A percentage cost uplift of 0.5% was applied to account for this.
- A7.71 The overall cost uplift estimated using the 2017 Distribution Model at the GM area level is illustrated in Figure A7.10 and Table A 7.11 below. The 2017 Distribution Model estimates a minimum cost uplift of 6.4% would be required to achieve a fault repair level of 85% assuming lower bound on its task time. This minimum cost uplifts rises to 8.4% if it allows for an upper limit on the task times and improvement in its provision SLA from 12 to 11 days.³⁰⁷

³⁰⁵ This is minimum because Openreach expect a larger portion of the workforce will require higher skills to achieve higher service levels resulting in higher training, salary and equipment costs.

³⁰⁶ These are 80% FAD and 90% CDD in 2015/16.

³⁰⁷ Openreach have also estimated costs for a range of service maintenance level mixes which it refers to as the High Case.

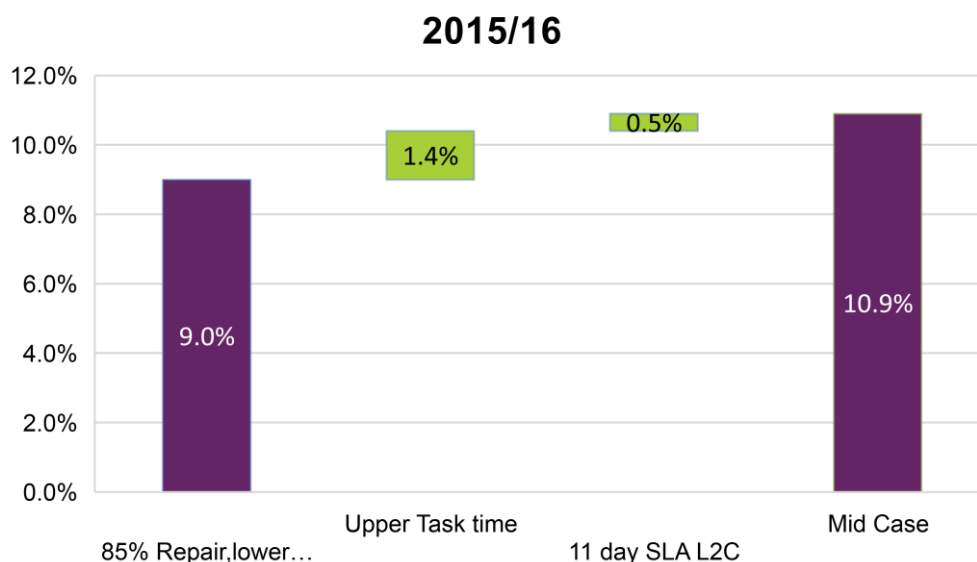
Figure A7.10: Performance-Costs estimates using Openreach's Distribution Model at GM area levels



Source: Openreach 2017 Distribution Model outputs submission to Ofcom on 9 February 2017

A7.72 When the model is run at the SOM area level for the same scenario above, the minimum cost uplifts show an increased delta between 2.5% to 2.6%.

Figure A7.11: Resource uplift estimates using the 2017 Distribution Model at SOM area levels



Source: Openreach 2017 Distribution Model outputs submission to Ofcom on 9 February 2017

A7.73 Furthermore, Openreach has modelled minimum resource uplifts for a range of fault repair performance levels with the installation order performance level set at the base year levels. The results are presented in Table A7.12. It should be noted that an installation order SLA of 12 days and not 11 days is assumed.

Table A7.12: Openreach's resource uplift estimates for improved repair performance

Repair on-time performance	2015/2016 actual service maintenance level mix
82.0%	9.7%
85.0%	10.1%
87.0%	10.4%
90.0%	12.3%

Source: Openreach 2017 Distribution Model outputs submission to Ofcom on 9 February 2017, SOM level analysis

A7.74 Openreach did not model a repair standard of performance above 90%. It maintained that it is not feasible for it to achieve repair target levels higher than this in practice.

Annex 8

Draft legal instruments

PART I: NOTIFICATION OF PROPOSED DIRECTION UNDER SECTIONS 49 AND 49A OF THE COMMUNICATIONS ACT 2003 AND PROPOSED CONDITION 9.1A AND CONDITION 11.1 RELATING TO THE IMPOSITION OF QUALITY OF SERVICE REQUIREMENTS ON BT IN RESPECT OF THE PROVISION OF NETWORK ACCESS TO WHOLESALE ANALOGUE LINE RENTAL, METALLIC PATH FACILITIES AND CERTAIN VIRTUAL UNBUNDLED LOCAL ACCESS SERVICES

Background

1. On 1 December 2016, OFCOM published a document titled “*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (the “2016 NMR Consultation”)³⁰⁸. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the UK (excluding the Hull Area³⁰⁹).
2. In the 2016 NMR Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access on reasonable request³¹⁰ and to comply with all such quality of service requirements in relation to the provision of network access, as OFCOM may from time to time direct.³¹¹
3. In parallel to the making of this Notification, OFCOM is publishing a document titled “*Wholesale Local Access Market Review Consultation*” (the “2017 WLA Consultation”)³¹². In that consultation, OFCOM sets out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom (excluding the Hull Area).
4. In the 2017 WLA Consultation, OFCOM proposes to impose a number of obligations on BT, including a requirement to provide network access in the form of Local Loop Unbundling and Virtual Unbundled Local Access.³¹³ OFCOM also proposes to impose

³⁰⁸ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/narrowband-market-review/>.

³⁰⁹ As defined in paragraph 14 of the Annex to this Notification.

³¹⁰ Condition 1A at Annex 6 of the 2016 NMR Consultation.

³¹¹ Condition 9.1A at Annex 6 of the 2016 NMR Consultation.

³¹² <https://www.OFCOM.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>.

³¹³ Condition 1 at Annex 23 of the 2017 WLA Consultation.

an obligation on BT to comply with all such quality of service requirements in relation to the provision of network access, as OFCOM may from time to time direct.³¹⁴

5. In parallel to the review of the market for the provision of wholesale narrowband and local access services, OFCOM launched a review into the quality of service requirements that should be imposed on BT in relation to these services, pursuant to the SMP obligations proposed in the 2016 NMR Consultation and the 2017 WLA Consultation. This Notification sets out OFCOM's proposals in this respect.

Proposal to give a direction

6. OFCOM is proposing, in accordance with section 49A of the Communications Act 2003 ("the Act"), to give a direction pursuant to proposed Condition 9.1A at Annex 6 of the 2016 NMR Consultation and Condition 11.1 at Annex 23 of the 2017 WLA Consultation, requiring BT to comply with the specified quality of service requirements in relation to the provision of network access to Wholesale Analogue Line Rental, Metallic Path Facilities and certain Generic Ethernet Access services.
7. The proposed Direction is set out in the Annex to this Notification.
8. The effect of, and the reasons for giving, the proposed Direction are set out in the consultation document accompanying this Notification.

OFCOM's duties and legal tests

9. For the reasons set out in the consultation document accompanying this Notification, OFCOM considers that the proposed direction set out in the Annex complies with the requirements of section 49(2) of the Act.
10. In making the proposals set out in this Notification, OFCOM has considered and acted in accordance with its general duties set out in section 3 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.

Making representations

11. Representations may be made to OFCOM about the proposals set out in this Notification and the consultation document accompanying in by no later than 9 June 2017.

³¹⁴ Condition 11.1 at Annex 23 of the 2017 WLA Consultation.

12. In accordance with section 49C(1)(b) of the Act, a copy of this Notification, together with the Direction set out in the Annex to this Notification, will be sent to the Secretary of State.

Signed



Marina Gibbs

Competition Policy Director

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

31 March 2017

ANNEX

[DRAFT] Direction under section 49 of the Communications Act 2003 and Condition [9.1A] and Condition [11.1] requiring BT to comply with quality of service standards in relation to the provision of network access to Wholesale Analogue Line Rental, Metallic Path Facilities and certain Virtual Unbundled Local Access services

Background

1. On 1 December 2016, OFCOM published a document titled “*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (the “2016 NMR Consultation”)³¹⁵. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the UK (excluding the Hull Area³¹⁶).
2. In the 2016 NMR Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access³¹⁷ and to comply with all such quality of service requirements in relation to the provision of network access to regulated products, as OFCOM may from time to time direct³¹⁸.
3. On 31 March 2017, OFCOM published a document titled “*Wholesale Local Access Market Review Consultation*” (the “2017 WLA Consultation”)³¹⁹. In that Consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area.³²⁰
4. In the 2017 WLA Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access in the form of Local Loop Unbundling and Virtual Unbundled Local Access. OFCOM also proposed to impose an obligation on BT to comply with all such quality of service requirements in relation to the provision of network access, as OFCOM may from time to time direct.

³¹⁵ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/narrowband-market-review>.

³¹⁶ As defined in paragraph 14 of the Annex to this Notification.

³¹⁷ Condition 1A.1 at Annex 6 of the 2016 NMR Consultation.

³¹⁸ Condition 9.1A at Annex 6 of the 2016 NMR Consultation.

³¹⁹ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>.

³²⁰ As defined in paragraph 14 of this Direction.

5. On 31 March 2017, OFCOM published a document titled “*Quality of Service for WLR, MPF and GEA: Consultation*”, setting out the specific quality of service requirements that it proposed to impose on BT (“the 2017 QoS Consultation”). Annex 8 of that document contained a notification under section 49A of the Communications Act 2003 (“the Act”) in which OFCOM set out, for domestic consultation, its proposals to give a direction to BT requiring it to comply with specified quality standards when providing network access to Metallic Path Facilities and Virtual Unbundled Local Access by way of its Generic Ethernet Access services provided through BT’s Fibre-to-the-Cabinet network. OFCOM invited responses to the 2017 QoS Consultation by 9 June 2019.
6. OFCOM is now concluding its review of the wholesale narrowband and local access markets, making market power determinations and setting appropriate SMP conditions, including requirements on BT to comply with all such quality of service requirements as OFCOM may from time to time direct in relation to the provision of network access ([*Conditions relevant to the provision of network access*]). This Direction concerns matters to which these Conditions relate.

OFCOM’s duties and legal tests

7. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that, in accordance with section 49(2) of the Act, this Direction is:
 - a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
 - b) not such as to discriminate unduly against particular persons or against a particular description of persons;
 - c) proportionate to what it is intended to achieve; and
 - d) in relation to what it is intended to achieve, transparent.
8. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.
9. OFCOM has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified OFCOM of any international obligation of the United Kingdom for the purposes of section 49A(6)(b) of the Act.

10. The proposals set out in the 2017 QoS Consultation contained proposals of EU significance for the purposes of the Act. Therefore, after making any modifications of the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM sent on [DATE] a copy of them, and of a draft of the statement accompanying this Notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities of every other member State for EU consultation, in accordance with section 49B(2) of the Act.
11. [OFCOM received comments from the European Commission on its proposals on [DATE], and has made such modifications to this Notification and the statement accompanying this notification as it considers appropriate].

Decision

12. OFCOM hereby directs BT to act comply with the Quality of Service standards as set out in the Schedule with effect from 1st of April 2018.
13. The effects of, and the reasons for the decision to give the Direction are set out in the accompanying statement.

Interpretation

14. For the purposes of interpreting the Schedule, the following definitions shall apply:
- i. **“Access Agreement”** means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with [*Conditions relevant to the provision of network access*];
 - ii. **“Committed Date”** means the date agreed between the Dominant Provider and a Third Party for an Order to become a Completed Order;
 - iii. **“Completed Order”** means an Order that has been provisioned and for which all other related work has been carried out;
 - iv. **“Dominant Provider”** means BT;
 - v. **“Equivalence Management Platform”** means the Dominant Provider’s operational support system designed to handle the majority of transactions for equivalence of inputs and network access;
 - vi. **“Exchange Line”** means apparatus comprised in the Dominant Provider’s Electronic Communications Network and installed for the purpose of connecting a telephone exchange run by the Dominant Provider to a Network Termination Point comprised in Network Termination and Testing Apparatus

installed by the Dominant Provider for the purpose of providing electronic communications services at the premises at which the Network Termination and Testing Apparatus is located;

- vii. **“Fault”** means a degradation or problem with MPF, WLR and/or GEA-FTTC (as applicable) that is identified by the Dominant Provider or a Third Party and which is registered on the Dominant Provider’s operational support system;
- viii. **“First Relevant Year”** means the period starting on 1 April 2018 and ending on 31 March 2019;
- ix. **“FTTC”** means Fibre-to-the-Cabinet, an Electronic Communications Network consisting of optical fibre extending from the local access node to the street cabinet;
- x. **“GEA”** means Generic Ethernet Access, the BT non-physical wholesale services providing wholesale access to higher speed broadband products;
- xi. **“GEA – FTTC”** means Virtual Unbundled Local Access provided through BT’s GEA services over its FTTC network;
- xii. **“High Level MBORC Declaration”** means any MBORC Declaration from the Dominant Provider in respect of a Relevant Region (or a part thereof) that an MBORC has occurred in relation to network access to MPF, WLR or GEA-FTTC, as applicable, but only in respect of “major” MBORC Declarations;
- xiii. **“Hull Area”** means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communication (Hull) plc, (now known as KCOM);
- xiv. **“Level 2 Working Day”** means any day other than Sundays, public holidays or bank holidays in England and Wales, Scotland or Northern Ireland (as applicable);
- xv. **“MBORC”** means Matters Beyond Our Reasonable Control, a force majeure event under the relevant Access Agreement, the occurrence of which releases the Dominant Provider from the liability to make any payment under the corresponding Service Level Guarantee;
- xvi. **“MPF”** means Metallic Path Facilities;

- xvii. **“Order”** means a request for MPF, WLR or GEA-FTTC submitted to the Dominant Provider by a Third Party;
- xviii. **“Quality of Service Standards”** has the meaning given to it in paragraph 1 of the Schedule;
- xix. **“Relevant Region”** means the following ten regions, as defined by the Dominant Provider:
 - East Anglia;
 - London;
 - North East;
 - North Wales and North Midlands;
 - North West;
 - Scotland;
 - South East;
 - South Wales and South Midlands;
 - Wessex; and
 - Northern Ireland;

or other such regions as OFCOM may agree with the Dominant Provider or direct from time to time, but which cumulatively at all times cover the wholesale analogue line rental and wholesale local access markets in the UK, as applicable, excluding the Hull Area.;

- xx. **“Relevant Year”** means the First Relevant Year, the Second Relevant Year or a Subsequent Relevant Year, as applicable.
- xxi. **“Second Relevant Year”** means the period starting on 1 April 2019 and ending on 31 March 2020;
- xxii. **“Subsequent Relevant Year”** means the period starting on 1 April 2020 and ending on 31 March 2021, and following 31 March 2021, every 12-month period beginning on 1 April and ending on 31 March;

- xxiii. **“Service Maintenance Level 1”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of WLR, MPF or GEA services, as applicable, to Third Parties;
- xxiv. **“Service Maintenance Level 2”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of WLR, MPF or GEA services, as applicable, to Third Parties;
- xxv. **“Third Party”** means a person providing a public Electronic Communications Network or a person providing a public Electronic Communications Service;
- xxvi. **“WLR”** means Wholesale Analogue Line Rental; and
- xxvii. **“Working Day”** means any day other than Saturdays, Sundays, public holidays or bank holidays in England and Wales, Scotland or Northern Ireland (as applicable).

15. For the purposes of interpreting this direction and Schedule:

- a) except as otherwise defined, words or expressions used shall have the same meaning as they have been ascribed at Annex [X] of the [*title of final statement in relation to the 2016 NMR Consultation*] and Annex [X] of the [*title of final statement in relation to the 2017 WLA Consultation*], and otherwise any word or expression as it has in the Act;
- b) headings and titles shall be disregarded;
- c) expressions cognate with those referred to in this direction shall be construed accordingly; and
- d) the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

16. The Schedule to this Direction shall form part of this Direction.

17. This Direction will take effect on 1 April 2018.

Signed

[NAME]

[POSITION]

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

[DATE]

Schedule

1. Except in so far as OFCOM may from time to time otherwise consent in writing, in relation to the provision of network access to WLR, MPF and GEA-FTTC under [*relevant conditions in relation to the provision of network access*] the following shall be the **Quality of Service Standards**.

Installations

Quality of Service Standard 1

2. In relation to the provision of MPF, WLR and GEA-FTTC services, in aggregate, the Dominant Provider shall offer appointments, where required for the provision of those services, that are—
 - (a) within 12 Working Days of a corresponding Order being placed on the Equivalence Management Platform by a Third Party in at least 89% of such instances in the First Relevant Year and the Second Relevant Year;
 - (b) within 10 Working Days of a corresponding Order being placed on the Equivalence Management Platform by a Third Party in at least 89% of such instances in each Subsequent Relevant Year.

Quality of Service Standard 2

3. In relation to the provision of MPF, WLR and GEA-FTTC services, in aggregate, the Dominant Provider shall complete the provision of those services on the Committed Date—
 - (a) in the First Relevant Year and Second Relevant Year: in at least 91% of such instances;
 - (b) in each Subsequent Relevant Year: in at least 94% of such instances.

Fault repair

Quality of Service Standard 3

4. The Dominant Provider shall complete the repair of Faults that are subject to Service Maintenance Level 1 such that, in aggregate, the percentage of repairs which are completed by the end of the second Working Day after such Faults have been placed on the Equivalence Management Platform is—
 - (a) greater than or equal to 80% in the First Relevant Year;

(b) greater than or equal to 87% in the Second Relevant Year; and

(c) greater than or equal to 90% in each Subsequent Relevant Year;

Quality of Service Standard 4

5. The Dominant Provider shall complete the repair of Faults that are subject to Service Maintenance Level 1 such that, in aggregate, the percentage of repairs which are completed by the end of the seventh Working Day after such Faults have been placed on the Equivalence Management platform is—

(a) greater than or equal to 95% in the First Relevant Year;

(b) greater than or equal to 96% in the Second Relevant Year; and

(c) greater than or equal to 97% in each Subsequent Relevant Year.

Quality of Service Standard 5

6. The Dominant Provider shall complete the repair of Faults that are subject to Service Maintenance Level 2 such that, in aggregate, the percentage of repairs which are completed by the end of the next Level 2 Working Day after such Faults have been placed on the Equivalence Management Platform is—

(a) greater than or equal to 80% in the First Relevant Year;

(b) greater than or equal to 87% in the Second Relevant Year;

(c) greater than or equal to 90% in each Subsequent Relevant Year.

Quality of Service Standard 6

7. The Dominant Provider shall complete the repair of Faults that are subject to Service Maintenance Level 2 such that, in aggregate, the percentage of repairs which are completed by the end of the sixth Working Day after such Faults have been placed on the Equivalence Management Platform is—

(a) greater than or equal to 95% in the First Relevant Year;

(b) greater than or equal to 96% in the Second Relevant Year;

(c) greater than or equal to 97% in each Subsequent Relevant Year.

Obligation to comply with the each of the Quality of Service Standards

Quality of Service Standards 1, 2, 3, and 5

8. In each Relevant Year:

- (a) in eight of the ten Relevant Regions the Dominant Provider must comply with each of Quality of Service Standards 1, 2, 3 and 5; and
- (b) in the remaining two Relevant Regions the Dominant Provider must comply with each of Quality of Service Standards 1, 2, 3, and 5, except that in calculating the number of instances in which the Dominant Provider did not meet the relevant obligations, instances of failure occurring within an area that was subject to a High Level MBORC Declaration within eight weeks of the Dominant Provider making that High Level MBORC Declaration and the Fault or Order (as applicable) shall be excluded.

Quality of Service Standards 4 and 6

- 9. In each Relevant Year, the Dominant Provider must comply with each of Quality of Service Standards 4 and 6 in the UK as a whole.
- 10. Where the Dominant Provider relies upon the exemption in paragraph 8(b) to comply with any of Quality of Service Standards 1, 2, 3 and 5 in up to two Relevant Regions, in calculating compliance with the requirements set out in paragraph 9 for the UK as a whole, the following instances of failure shall be excluded:
 - instances of failure occurring within the up to two Relevant Regions that were excluded for the purpose of assessing compliance with paragraph 8(b).
- 11. The Dominant Provider must record, maintain and supply to OFCOM in writing, no later than three months after the end of each Relevant Year the data necessary for OFCOM to monitor compliance by the Dominant Provider with the requirements set out in this Direction.

PART II: NOTIFICATION OF PROPOSED DIRECTIONS UNDER SECTIONS 49 AND 49A OF THE COMMUNICATIONS ACT 2003 AND PROPOSED CONDITION 9.1A AND CONDITION 11.2 RELATING TO TRANSPARENCY AND THE PUBLICATION OF KPIS BY BT FOR SPECIFIED WHOLESALE ANALOGUE LINE RENTAL, METALLIC PATH FACILITIES, SHARED ACCESS AND VIRTUAL UNBUNDLED LOCAL ACCESS SERVICES

1. On 1 December 2016, OFCOM published a document titled “*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (the “2016 NMR Consultation”)³²¹. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the United Kingdom (excluding the Hull Area³²²).
2. In the 2016 NMR Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access to Wholesale Analogue Line Rental services, as soon as reasonably possible upon reasonable request and on fair and reasonable terms.³²³ OFCOM also proposed to require BT not to unduly discriminate when providing network access to third parties and to do so on an equivalence of inputs basis³²⁴ and to comply with all such quality of service requirements in relation to the provision of network access, as OFCOM may from time to time direct.³²⁵
3. In parallel to the making of this Notification, OFCOM is publishing a document titled “*Wholesale Local Access Market Review Consultation*” (the “2017 WLA Consultation”)³²⁶. In that consultation, OFCOM sets out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-

³²¹ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/narrowband-market-review>.

³²² This is the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communication (Hull) plc, (now known as KCOM).

³²³ Condition 1A at Annex 6 of the 2016 NMR Consultation.

³²⁴ Conditions 2 and 3 at Annex 6 of the 2016 NMR Consultation.

³²⁵ Condition 9.1A at Annex 6 of the 2016 NMR Consultation.

³²⁶ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>.

based and fibre-based wholesale local access at a fixed location in the United Kingdom (excluding the Hull Area).

4. In the 2017 WLA Consultation, OFCOM proposes to impose a number of obligations on BT, including a requirement to provide network access on fair and reasonable terms to Local Loop Unbundling and Virtual Unbundled Local Access.³²⁷ OFCOM also proposes to impose an obligation on BT not to unduly discriminate in the provision of network access and to do so on an equivalence of inputs basis.³²⁸ In addition, OFCOM proposes that BT be required to publish all such information as to the quality of service in relation to network access, in such manner and form, and including such content, as OFCOM may from time to time direct.³²⁹
5. In parallel to the review of the market for the provision of wholesale narrowband and local access services, OFCOM launched a review into the quality of service requirements and transparency obligations that should be imposed on BT in relation to these services, pursuant to the SMP obligations proposed in the 2016 NMR Consultation and the 2017 WLA Consultation. This Notification sets out OFCOM's proposals in this respect.

Proposal to give directions

6. OFCOM is proposing, in accordance with section 49A of the Communications Act 2003 ("the Act"), to give a direction pursuant to proposed Condition 9.1A at Annex 6 of the 2016 NMR Consultation and Condition 11.2 at Annex 23 of the 2017 WLA Consultation, requiring BT to comply with the specified quality of service requirements in relation to the provision of network access to Wholesale Analogue Line Rental, Local Loop Unbundling and certain Generic Ethernet Access services.
7. The proposed Directions are set out in the Annexes to this Notification.
8. The effect of, and the reasons for giving, the proposed Directions are set out in the consultation document accompanying this Notification.

³²⁷ Condition 1 of Annex 23 to the 2017 WLA Consultation.

³²⁸ Conditions 4 and 5 of Annex 23 to the 2017 WLA Consultation.

³²⁹ See Condition 11.2 of Annex 23 to the 2017 WLA Consultation.

OFCOM's duties and legal tests

9. For the reasons set out in the consultation document accompanying this Notification, OFCOM considers that the proposed directions set out in the Annexes to this Notification comply with the requirements of section 49(2) of the Act.
10. In making the proposals set out in this Notification, OFCOM has considered and acted in accordance with its general duties set out in section 3 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.

Making representations

11. Representations may be made to OFCOM about the proposals set out in this Notification and the consultation document accompanying in by no later than 9 June 2017.
12. In accordance with section 49C(1)(b) of the Act, a copy of this Notification, together with the Directions set out in the Annexes to this Notification, will be sent to the Secretary of State.

Signed

A handwritten signature in black ink, reading "M. Gibbs", is enclosed within a thin black rectangular border.

Marina Gibbs

Competition Policy Director, OFCOM

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

31 March 2017

ANNEX 1

[DRAFT] Direction under section 49 of the Communications Act 2003 and Condition [9A.1] requiring transparency and the publication of KPIs by BT for specified Wholesale Analogue Line Rental services

Background

1. On 1 December 2016, OFCOM published a document titled “*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (the “2016 NMR Consultation”)³³⁰. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the United Kingdom (excluding the Hull Area³³¹).
2. In the 2016 NMR Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access to Wholesale Analogue Line Rental services, as soon as reasonably possible upon reasonable request and on fair and reasonable terms.³³² OFCOM also proposed to require BT not to unduly discriminate when providing network access to third parties and to do so on an equivalence of inputs basis³³³ and to comply with all such quality of service requirements in relation to the provision of network access, as OFCOM may from time to time direct.³³⁴
3. On 31 March 2017, OFCOM published a document titled “*Quality of service for WLR, MPF and GEA: Consultation*”, setting out the specific transparency requirements that it proposed to impose on BT (“the 2017 QoS Consultation”). Annex 23 of that document contained a notification under section 49A of the Communications Act 2003 (“the Act”) in which OFCOM set out, for domestic consultation, its proposals to give a direction to BT requiring it to publish certain information in relation to the provision of network access to Wholesale Analogue Line Rental services. OFCOM invited responses to the 2017 QoS Consultation by 9 June 2017.

³³⁰ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/narrowband-market-review>.

³³¹ As defined in paragraph 23 of this Direction.

³³² Condition 1A at Annex 6 of the 2016 NMR Consultation.

³³³ Conditions 2 and 3 at Annex 6 of the 2016 NMR Consultation.

³³⁴ Condition 9.1A at Annex 6 of the 2016 NMR Consultation.

4. OFCOM is now concluding its review of the wholesale narrowband markets, making market power determinations and setting appropriate SMP conditions, including requirement on BT to comply with all such quality of service requirements as OFCOM may from time to time direct in relation to the provision of network access (see [*insert reference to the relevant Conditions*]). This Direction concerns matters to which these Conditions relate.
5. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that, in accordance with section 49(2) of the Act, this Direction is:
 - a. objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
 - b. not such as to discriminate unduly against particular persons or against a particular description of persons;
 - c. proportionate to what it is intended to achieve; and
 - d. in relation to what it is intended to achieve, transparent.
6. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act.
7. OFCOM has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified OFCOM of any international obligation of the United Kingdom for the purposes of section 49A(6)(b) of the Act.
8. The proposals set out in the 2017 QoS Consultation contained proposals of EU significance for the purposes of the Act. Therefore, after making any modifications of the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM sent on [DATE] a copy of them, and of a draft of the statement accompanying this Notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities of every other member State for EU consultation, in accordance with section 49B(2) of the Act.

9. [OFCOM received comments from the European Commission on its proposals on [DATE], and has made such modifications to this Notification and the statement accompanying this notification as it considers appropriate].

Direction

10. OFCOM hereby, pursuant to section 49 of the Act and Condition [9.1A], directs the Dominant Provider to act as prescribed in paragraphs 11 to 20 below.
11. The Dominant Provider must publish to Third Party Customers the information specified in paragraphs 1 and 2 of Schedule 1 to this Direction in relation to the provision of WLR, as required in paragraphs 15 or 16 below, as applicable.
12. The Dominant Provider must provide to individual Third Party Customers on request the information specified in paragraphs 8 of Schedule 1 to this Direction in relation to the provision of WLR to them, as required in paragraphs 15 or 16 below, as applicable.
13. The Dominant Provider must provide to OFCOM, by means of electronic mail to such person in OFCOM as notified from time to time, the information specified in paragraph 5 of Schedule 1 to this Direction in relation to the provision of WLR, as required in paragraphs 15 or 16 below, as applicable.
14. The Dominant Provider must publish the information specified in paragraph 6 of Schedule 1 to this Direction on a publicly accessible website, which for the avoidance of doubt should not require password access.
15. With the exception of the information specified in KPIs (viii) and (xi) of Schedule 1 to this Direction, the information required by paragraphs 11 to 13 above must be published and provided as required by the Dominant Provider on or before 18 May 2018 in respect of the previous month and, for each subsequent month, within 14 Working Days of the last Working Day of every month in respect of the previous month.
16. The information specified in KPIs (viii) and (xi) of Schedule 1 to this Direction must be published and provided as required by the Dominant Provider on or before 20 June 2018 in respect of the month preceding the previous month and, for subsequent periods, within 14 Working Days of the last Working Day of every month in respect of the months preceding the previous month.
17. The information required by paragraph 14 above must be published as required by the Dominant Provider on or before 19 July 2018 in respect of the previous three months

and, for subsequent periods, within 14 Working Days of the last Working Day of every third month in respect of the previous three months.

18. The Dominant Provider must publish and provide, as required, the information required in paragraphs 11 to 14 above in accordance with paragraphs 3 and 4 of Schedule 1 to this Direction, as applicable.
19. The Dominant Provider must provide to OFCOM the information required in paragraph 7 of Schedule 1 to this Direction upon request.
20. The Dominant Provider shall prepare and provide a report to OFCOM containing the information specified in Schedule 2 relating to Incomplete Installations and Repairs that have exceeded the relevant Service Level Commitment or Committed Date (as applicable) by more than 120 Working Days (the "Tails Report"). The first Tails Report must be provided to OFCOM by 19 July 2018 and thereafter within 14 Working Days of the last Working Day of every third month. On the same day as providing the Tails Report to OFCOM, the Dominant Provider shall publish on a publicly accessible website those elements of the report specified in Schedule 2, or such other elements of the report agreed by OFCOM in writing.
21. The Schedules to this Direction forms part of the Direction.
22. Nothing in this Direction shall require the Dominant Provider to publish confidential information relating to its business or that of a Third Party.
23. For the purpose of interpreting this Direction the following definitions shall apply:
 - a. "**Access Agreement**" means an agreement entered into between the Dominant Provider and a Third Party for the provision of WLR in accordance with [*Conditions relevant to the provision of network access*];
 - b. "**Appointed Order**" means an Order that requires an appointment for an engineering visit by the Dominant Provider to the end user's premises in order to become a Completed Order;
 - c. "**Committed Order**" means an Order that has been accepted by the Dominant Provider and for which a Committed Date has been confirmed;
 - d. "**Completed Order**" means an Order that has been provisioned and for which all other related work has been carried out;

- e. **“Committed Date”** means the date agreed between the Dominant Provider and a Third Party for an Order to become a Completed Order;
- f. **“Dominant Provider”** means BT;
- g. **“Equivalence Management Platform”** means the Dominant Provider's operational support system designed to handle the majority of transactions for equivalence of inputs and network access;
- h. **“Fault”** means a degradation or problem with the WLR service that is identified by the Dominant Provider or a Third Party and which has been registered on the Dominant Provider's operational support system;
- i. **“Hull Area”** means the area defined as the ‘Licensed Area’ in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc;
- j. **“Incomplete Installation and Repair”** means an Order that has not become a Completed Order and a Fault that has not achieved a Restored Service status;
- k. **“Installed Base”** means the average number of WLR lines that are in use during the relevant month;
- l. **“High Level MBORC Declaration”** means any MBORC Declaration from the Dominant Provider in respect of a Relevant Region (or a part thereof) that an MBORC has occurred in relation to network access to WLR but only in respect of “major” MBORC Declarations;
- m. **“KPI”** means key performance indicator;
- n. **“Local MBORC Declaration”** means any MBORC Declaration from the Dominant Provider in respect of a Relevant Region (or a part thereof) that an MBORC has occurred in relation to network access to WLR but only in respect of “local” MBORC Declarations;
- o. **“MBORC”** means Matters Beyond Our Reasonable Control, a force majeure event under the relevant Access Agreement, the occurrence of which releases

the Dominant Provider from the liability to make any payment under the corresponding Service Level Guarantee;

- p. **“MBORC Declaration”** means a declaration made by the Dominant Provider that an MBORC has occurred in relation to WLR and includes both ‘major’ and ‘local’ MBORC Declarations;
- q. **“Openreach”** means the BT group business offering Communications Providers’ products and services that are linked to BT’s nationwide Electronic Communications Network;
- r. **“Order”** means a request for the WLR submitted to the Dominant Provider by a Third Party;
- s. **“Pending Order”** means an Order which has been approved by the Dominant Provider and is awaiting a Contractual Delivery Date;
- t. **“Rejected Order”** means an Order rejected by the Dominant Provider because it is incomplete or incorrect;
- u. **“Relevant Region”** means the following ten regions, as defined by the Dominant Provider:
 - East Anglia;
 - London;
 - North East;
 - North Wales and North Midlands;
 - North West;
 - Scotland;
 - South East;
 - South Wales and South Midlands;
 - Wessex; and
 - Northern Ireland;

or other such regions as OFCOM may agree with the Dominant Provider or direct from time to time, but which cumulatively at all times cover the wholesale analogue line rental market in the UK, as applicable, excluding the Hull Area;

- v. **“Relevant Subscriber”** means any person who is a party to a contract with a provider of public electronic communications services for the supply of such services;
- w. **“Required First Appointment Date”** is the date on which the Dominant Provider is required to offer an installation appointment pursuant to *“Quality of Service Standard 1”* in [reference to final Direction under section 49 of the Communications Act 2003 and Condition [9.1A] and Condition [11.1] requiring BT to comply with quality of service standards in relation to the provision of network access to Wholesale Analogue Line Rental, Metallic Path Facilities and certain Virtual Unbundled Local Access services];
- x. **“Restored Service”** means the point at which the WLR service in relation to which a Fault was registered becomes available again for use by the Third Party;
- y. **“Scheduled Outages”** means the defined periods of time notified to Third Parties in accordance with the terms of the Dominant Provider’s contract for the WLR service whereby the Dominant Provider’s operational support system is not available for use by Third Parties in order for the Dominant Provider to perform certain tasks including, but not limited to, routine maintenance, changing configurations, software upgrades and updating facilities and may include specific maintenance activities;
- z. **“Service Maintenance Level 1”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of WLR to Third Parties;
- aa. **“Service Maintenance Level 2”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of the WLR to Third Parties;
- bb. **“Service Maintenance Level 3”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of the WLR to Third Parties;

- cc. **“Service Maintenance Level 4”** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of the WLR to Third Parties;
- dd. **“Third Party”** means a person providing a public electronic communications network or a person providing a public electronic communications service;
- ee. **“Third Party Customer”** means a Third Party purchasing WLR from the Dominant Provider;
- ff. **“Working Day”** means any day other than Saturdays, Sundays, public holidays or bank holidays in England and Wales, Scotland or Northern Ireland (as applicable); and
- gg. **“WLR”** means Wholesale Analogue Line Rental.

24. For the purpose of interpreting this Direction:

- a. except as otherwise defined, words or expressions used shall have the same meaning as they have been ascribed at Annex [X] of [*title of final statement in relation to the 2016 NMR Consultation*] and otherwise any word or expression as it has in the Act.
- b. headings and titles shall be disregarded;
- c. expressions cognate with those referred to in this Direction shall be construed accordingly; and
- d. the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

25. This Direction shall take effect on 1 April 2018.

Signed

[NAME]

[POSITION]

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

[DATE]

Schedule 1

Key Performance Indicators for Wholesale Analogue Line Rental

1. The Dominant Provider must publish to Third Party Customers the information required in KPIs (i) to (xvi) below in relation to the provision of WLR, in at least the detail outlined below:
 - a) an industry average (for the avoidance of doubt this includes provision by the Dominant Provider to itself where it does so) and;
 - b) provision of such services to itself.
2. In relation to KPIs (i) to (xvi) below, the Dominant Provider must also publish to Third Party Customers separate KPI results where options exist for Third Parties (excluding the Dominant Provider) to purchase different WLR services.
3. When publishing the information required in KPIs (i) to (iii), (v), (vi), (viii), (ix), (xi) and (xiii) to (xvi) below in accordance with paragraph 1, the Dominant Provider must also publish the numerators and denominators used to calculate the specified percentages.
4. When publishing KPIs in accordance with paragraphs 1 and 2 above, the Dominant Provider must publish KPIs (i) to (xvi) for the United Kingdom as a whole. In addition, the Dominant Provider must publish KPIs (i) to (iii) below split by reference to each Relevant Region.
5. The Dominant Provider must provide to OFCOM KPIs (i) to (xvi) below as described in paragraphs 1 to 4 above and paragraph 9 below by electronic mail to the designated person.
6. In respect of WLR, the Dominant Provider must publish information derived from the information required in KPIs (i), (ii), (iii)(a), (iii)(b), (iv), (vii), (x)(a), (x)(b), (xv) and (xvi) below on a publicly accessible website, which for the avoidance of doubt should not require password access.
7. The Dominant Provider must also provide to OFCOM data relating to specific Third Parties upon request.

8. The Dominant Provider must provide to each Third Party Customer upon request, on a confidential basis, the information required in KPIs (i) to (xvi) below for that Third Party Customer.
9. Where the Dominant Provider does not provide WLR to itself, it must instead publish or provide to Third Party Customers (as required) the information required in relation to the equivalent implicit wholesale product provided by the Dominant Provider to itself in order for it to provide downstream services to end users.

KPI (i) – Appointment availability

In relation to Appointed Orders placed on the Equivalence Management Platform by Third Parties in the relevant month and which were appointed on the same day as they were placed on the Equivalence Management Platform, the percentage of such Appointed Orders for which the first available date offered by the Dominant Provider for an appointment was:

- (a) on or before the Required First Appointment Date;
- (b) within one working day of the Required First Appointment Date;
- (c) within two working days of the Required First Appointment Date;
- (d) within five working days of the Required First Appointment Date;
- (e) within ten working days of the Required First Appointment Date; and
- (f) within twenty working days of the Required First Appointment Date.

from the date on which the corresponding Order was placed on the Equivalence Management Platform by a Third Party.

KPI (ii) – Provisioning of all orders

The percentage of all Completed Orders that were completed during the relevant month by;

- (a) the Committed Date;
- (b) one working day beyond the Committed Date;

- (c) two working days beyond the Committed Date;
- (d) five working days beyond the Committed Date;
- (e) ten working days beyond the Committed Date; and
- (f) twenty working days beyond the Committed Date.

KPI (iii) – Repair completion

- (a) In respect of services subject to Service Maintenance Level 1;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 1
- (ii) one working day beyond the timescale for Service Maintenance Level 1;
- (iii) two working days beyond the timescale for Service Maintenance Level 1;
- (iv) five working days beyond the timescale for Service Maintenance Level 1;
- (v) ten working days beyond the timescale for Service Maintenance Level 1; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 1.

- (b) In respect of services subject to Service Maintenance Level 2;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 2;
- (ii) one working day beyond the timescale for Service Maintenance Level 2;
- (iii) two working days beyond the timescale for Service Maintenance Level 2;
- (iv) five working days beyond the timescale for Service Maintenance Level 2;
- (v) ten working days beyond the timescale for Service Maintenance Level 2; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 2.

(c) In respect of services subject to Service Maintenance Level 3;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 3;
- (ii) one working day beyond the timescale for Service Maintenance Level 3;
- (iii) two working days beyond the timescale for Service Maintenance Level 3;
- (iv) five working days beyond the timescale for Service Maintenance Level 3;
- (v) ten working days beyond the timescale for Service Maintenance Level 3; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 3.

(d) In respect of services subject to Service Maintenance Level 4;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 4;
- (ii) one working day beyond the timescale for Service Maintenance Level 4;
- (iii) two working days beyond the timescale for Service Maintenance Level 4;
- (iv) five working days beyond the timescale for Service Maintenance Level 4;
- (v) ten working days beyond the timescale for Service Maintenance Level 4; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 4.

KPI (iv) – Average first available appointment date

In relation to Appointed Orders that are placed on the Equivalence Management Platform by Third Parties during the relevant month and which were appointed on the same day as they were placed on the Equivalence Management Platform, the average number of days (in Working Days) between the date on which the appointment was made and the first available date offered by the Dominant Provider for the corresponding appointment.

KPI (v) - Percentage of orders rejected

the percentage of Orders submitted during the relevant month that became Rejected Orders;

KPI (vi) – Provisioning of appointed orders

The percentage of Appointed Orders that became Completed Orders during the relevant month for Appointed Orders by;

- (a) the Committed Date;
- (b) one working day beyond the Committed Date;
- (c) two working days beyond the Committed Date;
- (d) five working days beyond the Committed Date;
- (e) ten working days beyond the Committed Date; and
- (f) twenty working days beyond the Committed Date.

KPI (vii) - Average installation time

- (a) In relation to Appointed Orders that became Completed Orders in the relevant month, the average number of days (in Working Days) from such Orders being placed on the Equivalence Management Platform by a Third Party and such Orders becoming a Completed Order;
- (b) In relation to Orders that became Completed Orders in the relevant month other than Appointed Orders, the average number of days (in Working Days) from such Orders being placed on the Equivalence Management Platform by a Third Party and such Orders becoming a Completed Order;

KPI (viii) – Percentage of repairs affected by MBORC Declarations that missed the Service Level Commitment

The total number of Faults:

- (a) affected by High Level MBORC Declarations which were not completed within the Service Level Commitment, expressed as a percentage of the number of Faults affected by High Level MBORC Declarations; and

- (b) affected by Local MBORC Declarations which were not completed within the Service Level Commitment, expressed as a percentage of the number of Faults affected by Local MBORC Declarations.

KPI (ix) - Percentage of orders reported as faulty

The percentage of Completed Orders that were reported as having a Fault during the relevant month whereby that Fault was reported within:

- (a) 8 calendar days; and
- (b) 28 calendar days;

of the date that it became a Completed Order;

KPI (x) - Average time to restore service

The average time (in working hours) during the relevant month for the Dominant Provider to achieve Restored Service after a Fault has been registered in relation to each of:

- (a) Service Maintenance Level 1;
- (b) Service Maintenance Level 2;
- (c) Service Maintenance Level 3; and
- (d) Service Maintenance Level 4;

KPI (xi) – Percentage of installations affected by MBORC Declarations that missed the Committed Date

The total number of Orders:

- (a) affected by High Level MBORC Declarations which were not completed by the Committed Date, expressed as a percentage of the number of Orders affected by High Level MBORC Declarations; and
- (b) affected by High Level MBORC Declarations which were not completed by the Committed Date, expressed as a percentage of the number of Orders affected by High Level MBORC Declarations.

KPI (xii) – Average time to restore service for repairs that have exceeded the Service Level Commitment by more than 20 working days

The average time (in working hours) for the Dominant Provider to achieve Restored Service for Faults that exceeded the Service Level Commitment by 20 working days or more in relation to each of:

- (a) Service Maintenance Level 1;
- (b) Service Maintenance Level 2;
- (c) Service Maintenance Level 3; and
- (d) Service Maintenance Level 4.

KPI (xiii) - Percentage of repeat faults

The percentage of Faults for which Restored Service was achieved in the relevant month that were repeat Faults, where a repeat Fault is a Fault registered within 28 calendar days of the Dominant Provider having achieved Restored Service of a previous Fault with the same service;

KPI (xiv) - Percentage of installed base reported as faulty

The number of Faults that achieved Restored Service during the relevant month, expressed as a percentage of the Installed Base;

KPI (xv) – Percentage of missed installation appointments

The percentage of installation appointments missed by Openreach engineers during the relevant month.

KPI (xvi) – Percentage of missed repair appointments

The percentage of repair appointments missed by Openreach engineers during the relevant month.

Schedule 2

Transparency report on long term delays to installations and repairs (the “Tails Report”)

The Tails Report shall contain at least the following:

- a) the number of Incomplete Repairs and Installations that have exceeded the Service Level Commitment or Committed Date, respectively, by more than 120 Working Days at the beginning and end of the quarter;
- b) how delayed beyond the 120 working days over Service Level Commitment or Committed Date these Incomplete Repairs and Installations are;
- c) the relevant wholesale services and telecoms providers to which the Incomplete Repairs and Installations relate;
- d) the locations of the Incomplete Repairs and Installations;
- e) the key cause(s) of the delays;
- f) summary details of plans to complete works, including estimated completion dates;
and
- g) summary details of communications and complaints concerning the Incomplete Repairs and Installations.

The Dominant Provider shall publish on a publicly accessible website information derived from the above in a form to be agreed with OFCOM.

ANNEX 2

[DRAFT] Direction under section 49 of the Communications Act 2003 and Condition [11.2] requiring the publication of KPIs by BT for specified Metallic Path Facilities, Shared Access and certain Virtual Unbundled Local Access services

Background

1. On 31 March 2017, OFCOM published a document titled “*Wholesale Local Access Market Review Consultation*” (the “2017 WLA Consultation”)
2. ³³⁵. As part of that review, OFCOM set out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom (excluding the Hull Area³³⁶).
3. In the 2017 WLA Consultation, OFCOM proposed to impose a number of obligations on BT, including a requirement to provide network access on fair and reasonable terms to Local Loop Unbundling and Virtual Unbundled Local Access.³³⁷ OFCOM also proposed to impose an obligation on BT not to unduly discriminate in the provision of network access and to do so on an equivalence of inputs basis.³³⁸ In addition, the Dominant Provider would be required to publish all such information as to the quality of service in relation to network access, in such manner and form, and including such content, as OFCOM may from time to time direct.³³⁹
4. On 31 March 2017, OFCOM published a document titled “*Quality of service for WLR, MPF and GEA*”, setting out the specific quality of service requirements that it proposed to impose on BT (“the 2017 QoS Consultation”). Annex 23 of that document contained a notification under section 49A of the Communications Act 2003 (“the Act”) in which OFCOM set out, for domestic consultation, its proposals to give a direction to BT requiring it to publish certain information in relation to the provision of network access to Wholesale Analogue Line Rental, Metallic Path Facilities, Shared Access and Generic Ethernet Access services. OFCOM invited responses to the 2017 QoS Consultation by 9 June 2017.

³³⁵ March 2017 WLA Consultation.

³³⁶ As defined in paragraph 23 of this Direction.

³³⁷ Condition 1 of Annex 23 to the 2017 WLA Consultation.

³³⁸ Conditions 4 and 5 of Annex 23 to the 2017 WLA Consultation.

³³⁹ See Condition 11.2 of Annex 23 to the 2017 WLA Consultation.

5. OFCOM is now concluding its review of the wholesale local access markets, making market power determinations and setting appropriate SMP conditions, including requirement on BT to publish all such information in relation to the provision of network access to the above services (*[insert reference to the relevant Conditions]*). This Direction concerns matters to which these Conditions relate.
6. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that, in accordance with section 49(2) of the Act, this Direction is:
 - a. objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
 - b. not such as to discriminate unduly against particular persons or against a particular description of persons;
 - c. proportionate to what it is intended to achieve; and
 - d. in relation to what it is intended to achieve, transparent.
7. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act.
8. OFCOM has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified OFCOM of any international obligation of the United Kingdom for the purposes of section 49A(6)(b) of the Act.
9. The proposals set out in the 2017 QoS Consultation contained proposals of EU significance for the purposes of the Act. Therefore, after making any modifications of the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM sent on [DATE] a copy of them, and of a draft of the statement accompanying this Notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities of every other member State for EU consultation, in accordance with section 49B(2) of the Act
10. [OFCom received comments from the European Commission on its proposals on [DATE], and has made such modifications to this Notification and the statement accompanying this notification as it considers appropriate].

Direction

11. OFCOM hereby, pursuant to section 49 of the Act and Condition [11.2], directs the Dominant Provider to act as prescribed in paragraphs 11 to 20 below.
12. The Dominant Provider must publish to Third Party Customers the information specified in paragraphs 1 and 3 of Schedule 1 to this Direction in relation to the provision of MPF, Shared Access and GEA services, as required in paragraphs 15 or 16 below, as applicable.
13. The Dominant Provider must provide to individual Third Party Customers on request the information specified in paragraph 9 of Schedule 1 to this Direction in relation to the provision of MPF, Shared Access and GEA services to them, as required in paragraphs 15 or 16 below, as applicable.
14. The Dominant Provider must provide to OFCOM, by means of electronic mail to such person in OFCOM as notified from time to time, the information specified in paragraph 6 of Schedule 1 to this Direction in relation to the provision of MPF, Shared Access and GEA services, as required in paragraph 15 below.
15. The Dominant Provider must publish the information specified in paragraph 7 of Schedule 1 to this Direction on a publicly accessible website, which for the avoidance of doubt should not require password access.
16. With the exception of the information specified in KPIs (viii) and (xi) of Schedule 1 to this Direction, the information required by paragraphs 11 to 13 above must be published and provided as required by the Dominant Provider on or before 18 May 2018 in respect of the previous month and, for each subsequent month, within 14 Working Days of the last Working Day of every month in respect of the previous month.
17. The information specified in KPIs (viii) and (xi) of Schedule 1 to this Direction must be published and provided, as required, by the Dominant Provider on or before 20 June 2018 in respect of the month preceding the previous month and, for subsequent periods, within 14 Working Days of the last Working Day of every month in respect of the month preceding the previous month.
18. The information required by paragraph 14 above must be published as required by the Dominant Provider on or before 19 July 2018 in respect of the previous three months and, for subsequent periods, within 14 Working Days of the last Working Day of every third month in respect of the previous three months.

19. The Dominant Provider must provide the information required in paragraph 8 of Schedule 1 to this Direction upon request.
20. The Dominant Provider shall prepare and provide a report to OFCOM containing the information specified in Schedule 2 relating to Incomplete Installations and Repairs that have exceeded the relevant Service Level Commitment or Committed Date (as applicable) by more than 120 Working Days (the “Tails Report”). The first Tails Report must be provided to OFCOM by 19 July 2018 and thereafter within 14 Working Days of the last Working Day of every third month. On the same day as providing the Tails Report to OFCOM, the Dominant Provider shall publish on a publicly accessible website those elements of the report specified in Schedule 2, or such other elements of the report agreed by OFCOM in writing.
21. The Dominant Provider must publish the information required in paragraphs 11 to 14 above in accordance with paragraphs 2, 4, 5 and 10 of the Schedule to this Direction, as applicable.
22. The Schedules to this Direction forms part of the Direction.
23. Nothing in this Direction shall require the Dominant Provider to publish confidential information relating to its business or that of a Third Party.
24. For the purpose of interpreting this Direction the following definitions shall apply:
 - a. “**Access Agreement**” means an agreement entered into between the Dominant Provider and a Third Party for the provision of MPF, Shared Access or GEA services, as applicable, in accordance with [*Conditions relevant to the provision of network access*];
 - b. “**Appointed Order**” means an Order that requires an appointment for an engineering visit by the Dominant Provider to the end user’s premise in order to become a Completed Order;
 - c. “**Committed Order**” means an Order that has been accepted by the Dominant Provider and for which a Committed Date has been confirmed;
 - d. “**Completed Order**” means an Order that has been provisioned and for which all other related work has been carried out;

- e. **“Committed Date”** means the date agreed between the Dominant Provider and a Third Party for an Order to become a Completed Order;
- f. **“Dominant Provider”** means BT;
- g. **“Equivalence Management Platform”** means the Dominant Provider's operational support system designed to handle the majority of transactions for equivalence of inputs and network access;
- h. **“Fault”** means a degradation or problem with MPF, Shared Access or GEA services, as applicable, that is identified by the Dominant Provider or a Third Party and which has been registered on the Dominant Provider's operational support system;
- i. **“FTTC”** means Fibre-to-the-Cabinet, an Electronic Communications Network consisting of optical fibre extending from the local access node to the street cabinet;
- j. **“FTTP”** means Fibre-to-the-Premises, an Electronic Communications Network consisting of optical fibre extending from the local access node to the customer's premises;
- k. **“GEA”** means Generic Ethernet Access, the BT non-physical wholesale services providing wholesale access to higher speed broadband products;
- l. **“GEA-FTTC”** means Virtual Unbundled Local Access provided through BT's GEA services over its FTTC network;
- m. **“GEA – FTTP”** means Virtual Unbundled Local Access provided through BT's GEA services over its FTTP network;
- n. **“High Level MBORC Declaration”** means any MBORC Declaration from the Dominant Provider in respect of a Relevant Region (or a part thereof) that an MBORC has occurred in relation to network access to MPF or GEA services, as applicable, but only in respect of “major” MBORC declarations;
- o. **“Hull Area”** means the area defined as the ‘Licensed Area’ in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc;

- p. **“Incomplete Installation and Repair”** means an Order that has not become a Completed Order and a Fault that has not achieved a Restored Service status;
- q. **“Installed Base”** means the average number of relevant MPF, Shared Access or GEA services, as applicable, that are in use during the relevant month;
- r. **“KPI”** means key performance indicator;
- s. **“Local MBORC Declaration”** means any declaration from the Dominant Provider in respect of a Relevant Region (or a part thereof) that an MBORC has occurred in relation to network access to MPF or GEA services, as applicable, but only in respect of “local” MBORC declarations;
- t. **“MBORC”** means Matters Beyond Our Reasonable Control, a force majeure event under the relevant Access Agreement, the occurrence of which releases the Dominant Provider from the liability to make any payment under the corresponding Service Level Guarantee;
- u. **“MBORC Declaration”** means a declaration made by the Dominant Provider that an MBORC has occurred in relation to the Relevant Wholesale Service and includes both ‘major’ and ‘local’ MBORC Declarations;
- v. **“MPF”** means Metallic Path Facilities;
- w. **““Openreach”** means the BT group business offering Communications Providers’ products and services that are linked to BT’s nationwide Electronic Communications Network;
- x. **“Order”** means a request for an MPF, Shared Access or GEA service, as applicable, submitted to the Dominant Provider by a Third Party;
- a. **“Pending Order”** means an Order which has been approved by the Dominant Provider and is awaiting a Contractual Delivery Date;
- b. **“Rejected Order”** means an Order rejected by the Dominant Provider because it is incomplete or incorrect;
- c. **“Relevant Region”** means the following ten regions, as defined by the Dominant Provider:

- East Anglia;
- London;
- North East;
- North Wales and North Midlands;
- North West;
- Scotland;
- South East;
- South Wales and South Midlands;
- Wessex; and
- Northern Ireland;

or other such regions as OFCOM may agree with the Dominant Provider or direct from time to time, but which cumulatively at all times cover the wholesale local access market in the UK, as applicable, excluding the Hull Area;

- d. **“Relevant Subscriber”** means any person who is a party to a contract with a provider of public electronic communications services for the supply of such services;
- e. **“Required First Appointment Date”** is the date on which the Dominant Provider is required to offer an installation appointment pursuant to *“Quality of Service Standard 1”* in [reference to final Direction under section 49 of the Communications Act 2003 and Condition [9.1A] and Condition [11.1] requiring BT to comply with quality of service standards in relation to the provision of network access to Wholesale Analogue Line Rental, Metallic Path Facilities and certain Virtual Unbundled Local Access services];
- f. **“Restored Service”** means the point at which an MPF, Shared Access or GEA service, as applicable, in relation to which a Fault was registered becomes available again for use by the Third Party;
- g. **“Scheduled Outages”** means the defined periods of time notified to Third Parties in accordance with the terms of the Dominant Provider’s contract for an

MPF, Shared Access or GEA service, as applicable, whereby the Dominant Provider's operational support system is not available for use by Third Parties in order for the Dominant Provider to perform certain tasks including, but not limited to, routine maintenance, changing configurations, software upgrades and updating facilities and may include specific maintenance activities;

- h. **"Service Maintenance Level 1"** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of MPF, Shared Access or GEA services, as applicable, to Third Parties;
- i. **"Service Maintenance Level 2"** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of MPF, Shared Access or GEA services, as applicable, to Third Parties;
- j. **"Service Maintenance Level 3"** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of MPF, Shared Access or GEA services, as applicable, to Third Parties;
- k. **"Service Maintenance Level 4"** means the fault clearance timescale specification of that name as defined by the Dominant Provider in its contracts for the provision of the MPF, Shared Access or GEA services, as applicable, to Third Parties;
- l. **"Third Party"** means a person providing a public electronic communications network or a person providing a public electronic communications service;
- m. **"Third Party Customer"** means a Third Party purchasing MPF, Shared Access or GEA services (as applicable) from the Dominant Provider; and
- n. **"Working Day"** means any day other than Saturdays, Sundays, public holidays or bank holidays in England and Wales, Scotland or Northern Ireland (as applicable); and

25. For the purpose of interpreting this Direction:

- a. except insofar as the context otherwise requires, words or expressions shall have the meaning assigned to them above and otherwise any word or

expression shall have the same meaning as it has in the Act, or if it has no meaning there, in [*reference to final statement in relation to the 2017 WLA Consultation*].

- b. headings and titles shall be disregarded;
- c. expressions cognate with those referred to in this Notification shall be construed accordingly; and
- d. the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

24. This Direction shall take effect on 1 April 2018.

Signed

[NAME]

[POSITION]

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

[DATE]

Schedule 1

Key Performance Indicators for Metallic Path Facilities, Shared Access and Generic Ethernet Access services

1. The Dominant Provider must publish to Third Party Customers the following:
 - a) the information required in KPIs (i) to (xiv) below in relation to the provision of network access to MPF;
 - b) the information required in KPIs (i) to (xiv) below in relation to the provision of network access to GEA-FTTC;
 - c) the information required in KPIs (i) to (xiv) below, except for the information required in KPIs (iii)(a), (x)(a) and (xii)(a), in relation to the provision of network access to GEA-FTTP;
 - d) the information required in KPIs (iii)(b), (iii)(c), (iii)(d), (x)(b), (x)(c), (x)(d), (xii)(b), (xii)(c), (xii)(d), (xiii) and (xiv) in relation to the provision of network access to Shared Access services;
 - e) the information required in KPI (xv) below in relation to the provision of network access to MPF and GEA services in aggregate; and
 - f) the information required in KPI (xvi) below in relation to the provision of network access to MPF, GEA and Shared Access services, in aggregate.
2. The Dominant Provider must publish the information required in paragraph 1 in at least the detail outlined below:
 - a) an industry average (for the avoidance of doubt this includes provision by the Dominant Provider to itself where it does so); and
 - b) provision of the specified services to itself.
3. The Dominant Provider must publish separate KPI results to Third Party Customers, as required in paragraph 1, where options exist for Third Parties (excluding the Dominant Provider) to purchase different MPF, Shared Access or GEA services.

4. When publishing the information required in KPIs (i) to (iii), (v), (vi), (viii), (ix), (xi) and (xiii) to (xvi), the Dominant Provider must also publish the numerators and denominators used to calculate the specified percentages.
5. Where the Dominant Provider is required to publish KPIs in accordance with paragraphs 1 to 3, it must publish them for the United Kingdom as a whole. In addition, the Dominant Provider must publish the following KPIs split by reference to each Relevant Region:
 - a) for MPF, KPIs (i) to (iii);
 - b) for GEA-FTTC, KPIs (i) to (iii) (where, in the case of KPI (iii)(a), there are 100,000 or more such active connections in a Relevant Region);
 - c) for Shared Access, KPIs (iii)(b) to (d); and
 - d) for GEA-FTTP, KPIs (iii)(b) to (d) where there are 100,000 or more such active connections in a Relevant Region.
6. The Dominant Provider must provide to OFCOM the KPIs required in paragraphs 1 to 5 above and paragraph 10 below by electronic mail to the designated person.
7. The Dominant Provider must publish information derived from the following KPIs on a publicly accessible website, which for the avoidance of doubt should not require password access:
 - a) the information required in KPIs (i), (ii), (iii)(a), (iii)(b), (iv), (vii) and x(a), (x)(b) in relation to the provision of network access to MPF;
 - b) the information required in KPIs (i), (ii), (iii)(a), (iii)(b), (iv), (vii) and x(a), (x)(b) in relation to the provision of network access to GEA-FTTC;
 - c) the information required in KPIs (xv) in relation to the provision of MPF and GEA services in the aggregate; and
 - d) the information required in KPI (xvi) in relation to the provision of network access to MPF, GEA and Shared Access services in the aggregate.

8. The Dominant Provider must also provide to OFCOM data relating to specific Third Parties upon request.
9. The Dominant Provider must provide to each Third Party Customer upon request, on a confidential basis, the information required in paragraph 1 above for that Third Party Customer.
10. Where the Dominant Provider does not provide LLU services to itself, it must instead publish or provide to Third Party Customers (as required) the information required in relation to the equivalent implicit wholesale product provided by the Dominant Provider to itself in order for it to provide downstream services to end users.

KPI (i) – Appointment availability

In relation to Appointed Orders placed on the Equivalence Management Platform by Third Parties in the relevant month and which were appointed on the same day as they were placed on the Equivalence Management Platform, the percentage of such Appointed Orders for which the first available date offered by the Dominant Provider for an appointment was:

- (a) one or before the Required First Appointment Date;
- (b) within one working day of the Required First Appointment Date;
- (c) within two working days of the Required First Appointment Date;
- (d) within five working days of the Required First Appointment Date;
- (e) within ten working days of the Required First Appointment Date; and
- (f) within twenty working days of the Required First Appointment Date.

from the date on which the corresponding Order was placed on the Equivalence Management Platform by a Third Party.

KPI (ii) – Provisioning of all orders

The percentage of all Completed Orders that were completed during the relevant month by;

- (a) the Committed Date;

- (b) one working day beyond the Committed Date;
- (c) two working days beyond the Committed Date;
- (d) five working days beyond the Committed Date;
- (e) ten working days beyond the Committed Date; and
- (f) twenty working days beyond the Committed Date.

KPI (iii) – Repair completion

- (a) In respect of services subject to Service Maintenance Level 1;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 1;
- (ii) one working day beyond the timescale for Service Maintenance Level 1;
- (iii) two working days beyond the timescale for Service Maintenance Level 1;
- (iv) five working days beyond the timescale for Service Maintenance Level 1;
- (v) ten working days beyond the timescale for Service Maintenance Level 1; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 1.

- (b) In respect of services subject to Service Maintenance Level 2;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 2;
- (ii) one working day beyond the timescale for Service Maintenance Level 2;
- (iii) two working days beyond the timescale for Service Maintenance Level 2;
- (iv) five working days beyond the timescale for Service Maintenance Level 2;
- (v) ten working days beyond the timescale for Service Maintenance Level 2; and

(vi) twenty working days beyond the timescales for Service Maintenance Level 2.

(c) In respect of services subject to Service Maintenance Level 3;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 3;
- (ii) one working day beyond the timescale for Service Maintenance Level 3;
- (iii) two working days beyond the timescale for Service Maintenance Level 3;
- (iv) five working days beyond the timescale for Service Maintenance Level 3;
- (v) ten working days beyond the timescale for Service Maintenance Level 3; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 3.

(d) In respect of services subject to Service Maintenance Level 4;

the percentage of Faults during the relevant month whereby the Dominant Provider achieved a Restored Service within:

- (i) the timescale for Service Maintenance Level 4;
- (ii) one working day beyond the timescale for Service Maintenance Level 4;
- (iii) two working days beyond the timescale for Service Maintenance Level 4;
- (iv) five working days beyond the timescale for Service Maintenance Level 4;
- (v) ten working days beyond the timescale for Service Maintenance Level 4; and
- (vi) twenty working days beyond the timescale for Service Maintenance Level 4.

KPI (iv) – Average first available appointment date

In relation to Appointed Orders that are placed on the Equivalence Management Platform by Third Parties during the relevant month and which were appointed on the same day as they were placed on the Equivalence Management Platform, the average number of days (in Working Days) between the date on which the appointment was made and the first available date offered by the Dominant Provider for the corresponding appointment.

KPI (v) - Percentage of orders rejected

The percentage of Orders submitted during the relevant month that became Rejected Orders;

KPI (vi) – Provisioning of appointed orders

The percentage of Appointed Orders that became Completed Orders during the relevant month by;

- (a) the Committed Date;
- (b) one working day beyond the Committed Date;
- (c) two working days beyond the Committed Date;
- (d) five working days beyond the Committed Date;
- (e) ten working days beyond the Committed Date; and
- (f) twenty working days beyond the Committed Date.

KPI (vii) - Average installation time

- (a) in relation to Appointed Orders that became Completed Orders in the relevant month, the average number of days (in Working Days) from such Orders being placed on the Equivalence Management Platform by a Third Party and such Orders becoming a Completed Order;
- (b) in relation to Orders that became Completed Orders in the relevant month other than Appointed Orders, the average number of days (in Working Days) from such Orders being placed on the Equivalence Management Platform by a Third Party and such Orders becoming a Completed Order;

KPI (viii) – Percentage of repairs affected by MBORC Declarations that missed the Service Level Commitment

The total number of Faults:

- (a) affected by High Level MBORC Declarations which were not completed within the Service Level Commitment, expressed as a percentage of the number of Faults affected by High Level MBORC Declarations; and

- (b) affected by Local MBORC Declarations which were not completed within the Service Level Commitment, expressed as a percentage of the number of Faults affected by Local MBORC Declarations.

KPI (ix) - Percentage of orders reported as faulty

The percentage of Completed Orders that were reported as having a Fault during the relevant month whereby that Fault was reported within:

- (a) 8 calendar days; and
- (b) 28 calendar days;

of the date that it became a Completed Order;

KPI (x) - Average time to restore service

The average time (in working hours) during the relevant month for the Dominant Provider to achieve Restored Service after a Fault has been registered in relation to each of:

- (a) Service Maintenance Level 1;
- (b) Service Maintenance Level 2;
- (c) Service Maintenance Level 3; and
- (d) Service Maintenance Level 4;

KPI (xi) – Percentage of installations affected by MBORC Declarations that missed the Committed Date

The total number of Orders:

- (a) affected by High Level MBORC Declarations which were not completed by the Committed Date, expressed as a percentage of the number of Orders affected by High Level MBORC Declarations; and
- (b) affected by Local MBORC Declarations which were not completed by the Committed Date, expressed as a percentage of the number of Orders affected by Local MBORC Declarations.

KPI (xii) – Average time to restore service for repairs that have exceeded the Service Level Commitment by more than 20 working days

The average time (in working hours) for the Dominant Provider to achieve Restored Service for faults that exceeded the Service Level Commitment by 20 working days or more in relation to each of:

- (a) Service Maintenance Level 1;
- (b) Service Maintenance Level 2;
- (c) Service Maintenance Level 3; and
- (d) Service Maintenance Level 4.

KPI (xiii) - Percentage of repeat faults

The percentage of Faults for which Restored Service was achieved in the relevant month that were repeat Faults, where a repeat Fault is a Fault registered within 28 calendar days of the Dominant Provider having achieved Restored Service of a previous Fault with the same service;

KPI (xiv) - Percentage of installed base reported as faulty

The number of Faults that achieved Restored Service during the relevant month, expressed as a percentage of the Installed Base;

KPI (xv) – Percentage of missed installation appointments

The percentage of installation appointments missed by Openreach engineers during the relevant month.

KPI (xvi) – Percentage of missed repair appointments

The percentage of repair appointments missed by Openreach engineers during the relevant month.

Schedule 2

Transparency report on long term delays to installations and repairs (the “Tails Report”)

The Tails Report shall contain at least the following:

- h) the number of Incomplete Repairs and Installations that have exceeded the Service Level Commitment or Committed Date, respectively, by more than 120 Working Days at the beginning and end of the quarter;
- i) how delayed beyond the 120 working days over Service Level Commitment or Committed Date these Incomplete Repairs and Installations are;
- j) the relevant wholesale services and telecoms providers to which the Incomplete Repairs and Installations relate;
- k) the locations of the Incomplete Repairs and Installations;
- l) the key cause(s) of the delays;
- m) summary details of plans to complete works, including estimated completion dates;
and
- n) summary details of communications and complaints concerning the Incomplete Repairs and Installations.

The Dominant Provider shall publish on a publicly accessible website information derived from the above in a form to be agreed with OFCOM.

PART III: NOTIFICATION OF PROPOSED DIRECTION UNDER SECTIONS 49 AND 49A OF THE COMMUNICATIONS ACT 2003 AND CONDITIONS 1A.2A(b)(ii) AND 1.5 RELATING TO THE PROVISION OF NETWORK ACCESS TO WHOLESALE ANALOGUE LINE RENTAL, METALLIC PATH FACILITIES AND CERTAIN VIRTUAL UNBUNDLED LOCAL ACCESS SERVICES

1. On 1 December 2016, OFCOM published a document titled "*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*" (the "2016 NMR Consultation").³⁴⁰ In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the UK (excluding the Hull Area³⁴¹).
2. OFCOM proposed to impose a requirement on BT to provide network access to Wholesale Analogue Line Rental Services on such terms, conditions and charges as OFCOM may from time to time direct.³⁴²
3. In parallel to the making of this Notification, OFCOM is publishing a document titled "*Wholesale Local Access Market Review Consultation*" (the "2017 WLA Consultation")³⁴³. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area, in the UK (excluding the Hull Area).
4. OFCOM proposes to impose a requirement on BT to provide network access in the form of Local Loop Unbundling and Virtual Unbundled Local Access.³⁴⁴ In addition OFCOM proposes to require BT to comply with any direction OFCOM may make from time to time under that condition.³⁴⁵

³⁴⁰ 2017 NMR Consultation

³⁴¹ This is the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communication (Hull) plc, (now known as KCOM).

³⁴² Condition 1A.2A(b)(ii) at Annex 6 of the 2016 NMR Consultation.

³⁴³ March 2017 WLA Consultation

³⁴⁴ Condition 1 at Annex 23 of the 2017 WLA Consultation.

³⁴⁵ Condition 1.5 at Annex 23 of the 2017 WLA Consultation.

5. In parallel to the review of the above markets, OFCOM has launched a review into the quality of service requirements that should be imposed on BT in relation to these services, pursuant to the SMP obligations proposed in the 2017 WLA Consultation and the 2016 NMR Consultation. As part of this review, OFCOM has considered whether it should make any directions in relation to the minimum number of days for which service level guarantees may be payable where BT fails to meet its service level commitments in relation to installations of new lines or fault repairs. This Notification sets out OFCOM's proposals in this respect.

Proposal to give a direction

6. OFCOM is proposing, in accordance with section 49 of the Communications Act 2003 ("the Act"), to give directions pursuant to proposed Condition 1A.2A(b)(ii) at Annex 6 of the 2016 NMR Consultation and Condition 1.5 at Annex 23 of the 2017 WLA Consultation, requiring BT to modify its terms and conditions for the provision of network access to provide that compensation for delays in installing new lines or repairing faults shall not be subject to a cap. The proposal covers the provision of network access to Metallic Path Facilities, Wholesale Analogue Line Rental and Virtual Unbundled Local Access provided via BT's Generic Ethernet Access – Fibre-to-the-Cabinet services.
7. The proposed Directions are set out in Annex 1 and Annex 2 to this Notification.
8. The effect of, and the reasons for giving, the proposed Directions are set out in the consultation document accompanying this Notification.

OFCOM's duties and legal tests

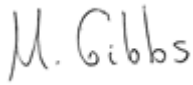
9. For the reasons set out in the consultation document accompanying this Notification, OFCOM considers that the proposed Directions set out in Annex 1 and Annex 2 comply with the requirements of section 49(2) of the Act.
10. In making the proposals set out in this Notification, OFCOM has considered and acted in accordance with its general duties set out in section 3 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.

Making representations

11. Representations may be made to OFCOM about the proposals set out in this Notification and the consultation document accompanying in by no later than 9 June 2017.

12. In accordance with section 49C(1)(b) of the Act, a copy of this Notification, together with the Direction set out in the Annex to this Notification, will be sent to the Secretary of State.

Signed

A handwritten signature in dark ink, appearing to read 'M. Gibbs'.

Marina Gibbs

Competition Policy Director

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

31 March 2017

Annex 1

DRAFT Direction under sections 49 and 49A of the Communications Act 2003 and Condition 1A.2A(b)(ii) relating to the provision of network access to Wholesale Analogue Line Rental services

Background

1. On 1 December 2016, OFCOM published a document titled “*Narrowband Market Review: Consultation on the proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (the “2016 NMR Consultation”).³⁴⁶ In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the provision of wholesale fixed analogue exchange lines, including the provision of Wholesale Analogue Line Rental services, in the UK (excluding the Hull Area).
2. OFCOM proposed to impose a requirement on BT to provide network access to Wholesale Analogue Line Rental Services on such terms, conditions and charges as OFCOM may from time to time direct.³⁴⁷
3. On 31 March 2017, OFCOM published a document titled “*Quality of service for WLR, MPF and GEA: Consultation*”, setting out the specific quality of service requirements that it proposed to impose on BT (“the 2017 QoS Consultation”). As part of that consultation, OFCOM proposed to make a direction in relation to the minimum number of days for which compensation shall be payable where BT fails to meet its service level commitments in relation to installations of new lines and fault repairs. Annex 8 of that document contained a notification under section 49A of the Communications Act 2003 (“the Act”) in which OFCOM set out, for domestic consultation, its proposals to give a direction to BT requiring it to modify its terms and conditions for the provision of network access in order to remove any provision limiting the minimum amount of days for which such compensation is due. OFCOM invited responses to the 2017 QoS Consultation by 9 June 2017.

OFCOM’s duties and legal tests

4. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that, in accordance with section 49(2) of the Act, this Direction is:

³⁴⁶ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/narrowband-market-review>.

³⁴⁷ Condition 1A.2A(b)(ii) at Annex 6 of the 2016 NMR Consultation.

- a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
 - b) not such as to discriminate unduly against particular persons or against a particular description of persons;
 - c) proportionate to what it is intended to achieve; and
 - d) in relation to what it is intended to achieve, transparent.
5. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.
6. OFCOM has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified OFCOM of any international obligation of the United Kingdom for the purposes of section 49A(6)(b) of the Act.
7. The proposals set out in the 2017 QoS Consultation contained proposals of EU significance for the purposes of the Act. Therefore, after making any modifications of the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM sent on [DATE] a copy of them, and of a draft of the statement accompanying this Notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities of every other member State for EU consultation, in accordance with section 49B(2) of the Act.
8. [OFCom received comments from the European Commission on its proposals on [DATE], and has made such modifications to this Notification and the statement accompanying this notification as it considers appropriate].

Decision

9. OFCOM has decided to give the following Direction with effect from [*one month after the date of final notification*]:

The Dominant Provider shall amend the terms and conditions which govern the supply of WLR so that no cap applies in relation to the period of time for which daily compensation is payable for a failure to install a WLR line or repair a Fault within the applicable Service Level Commitments.

10. The effects of, and the reasons for the decision to give the direction are set out in the accompanying statement.

Interpretation

11. For the purposes of interpreting the Schedule, the following definitions shall apply:

- i. **“Access Agreement”** means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with [*Conditions relevant to the provision of network access*];
- ii. **“Dominant Provider”** means BT;
- iii. **“Fault”** means a degradation or problem with WLR that is identified by the Dominant Provider or a Third Party and which is registered on the Dominant Provider’s operational support system.
- iv. **“Third Party”** means a person providing a public electronic communications network or a person providing a public electronic communications service; and
- v. **“WLR”** means Wholesale Analogue Line Rental.
- vi. For the purposes of interpreting this direction:
 - a) except as otherwise defined, words or expressions used shall have the same meaning as they have been ascribed at Annex [X] of the [*title of final statement on narrowband market review*], and otherwise any word or expression as it has in the Act;
 - b) headings and titles shall be disregarded;
 - c) expressions cognate with those referred to in this direction shall be construed accordingly; and
 - d) the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

Signed

[NAME]

[Position]

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

[DATE]

Annex 2

[DRAFT] Direction under sections 49 and 49A of the Communications Act 2003 and Condition 1.5 relating to requirements concerning the provision of network access to Metallic Path Facilities and certain Virtual Unbundled Local Access services

Background

1. On 31 March 2017, OFCOM published a document titled “*Wholesale Local Access Market Review Consultation*” (the “2017 WLA Consultation”)³⁴⁸. In that consultation, OFCOM set out its provisional view that BT has Significant Market Power in the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area, including access to Metallic Path Facilities and Virtual Unbundled Local Access delivered over BT’s fibre to the cabinet (FTTC) network, in the UK (excluding the Hull Area).
2. OFCOM proposed to impose a requirement on BT to provide network access to Local Loop Unbundling in the form of Metallic Path Facilities and Virtual Unbundled Local Access.³⁴⁹ In addition OFCOM proposed to require BT to comply with any direction OFCOM may make from time to time under that condition.³⁵⁰
3. On 31 March 2017, OFCOM published a document titled “*Quality of Service for WLR, MPF and GEA: Consultation*”, setting out the specific quality of service requirements that it proposed to impose on BT (“the 2017 QoS Consultation”). As part of that consultation, OFCOM proposed to make a direction in relation to the minimum number of days for which compensation shall be payable where BT fails to meet its service level commitments in relation to installations of new lines and fault repairs. Annex 8 of that document contained a notification under section 49A of the Communications Act 2003 (“the Act”) in which OFCOM set out, for domestic consultation, its proposals to give a direction to BT requiring it to modify its terms and in order to remove any provision limiting minimum amount of days for which such compensation is due. OFCOM invited responses to the 2017 QoS Consultation by 9 June 2017.

³⁴⁸ <https://www.OFCOM.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review/>.

³⁴⁹ Condition 1 at Annex 23 of the 2017 WLA Consultation.

³⁵⁰ Condition 1.5 at Annex 23 of the 2017 WLA Consultation.

OFCOM's duties and legal tests

4. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that, in accordance with section 49(2) of the Act, this Direction is:
 - a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
 - b) not such as to discriminate unduly against particular persons or against a particular description of persons;
 - c) proportionate to what it is intended to achieve; and
 - d) in relation to what it is intended to achieve, transparent.
5. For the reasons set out in the explanatory statement accompanying this Direction, OFCOM is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act and the duty to take account of European Commission recommendations for harmonisation in section 4A of the Act.
6. OFCOM has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified OFCOM of any international obligation of the United Kingdom for the purposes of section 49A(6)(b) of the Act.
7. The proposals set out in the 2017 QoS Consultation contained proposals of EU significance for the purposes of the Act. Therefore, after making any modifications of the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM sent on [DATE] a copy of them, and of a draft of the statement accompanying this Notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities of every other member State for EU consultation, in accordance with section 49B(2) of the Act.
8. [OFCOM received comments from the European Commission on its proposals on [DATE], and has made such modifications to this Notification and the statement accompanying this notification as it considers appropriate].

Decision

9. OFCOM has decided to give the following Direction set out in the Schedule with effect from [*one month after the date of final notification*]:

The Dominant Provider shall amend the terms and conditions which govern the supply of MPF and GEA-FTTC so that no cap applies in relation to the period of time for which

daily compensation is payable for a failure to install a MPF or a GEA-FTTC line, or repair a Fault, within the applicable Service Level Commitments

10. The effects of, and the reasons for the decision to give the direction are set out in the accompanying statement.

Interpretation

11. For the purposes of interpreting the Schedule, the following definitions shall apply:

- i. **“Access Agreement”** means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with [*Conditions relevant to the provision of network access*];
- ii. **“BT”** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined in section 1159 of the Companies Act 2006;
- iii. **“Dominant Provider”** means BT;
- iv. **“Fault”** means a degradation or problem with MPF or GEA-FTTC, as applicable, that is identified by the Dominant Provider or a Third Party and which is registered on the Dominant Provider’s operational support system;
- v. **“FTTC”** means Fibre-to-the-Cabinet, an Electronic Communications Network consisting of optical fibre extending from the local access node to the street cabinet;
- vi. **“GEA”** means Generic Ethernet Access, the BT non-physical wholesale services providing wholesale access to higher speed broadband products;
- vii. **“GEA – FTTC”** means Virtual Unbundled Local Access provided through BT’s GEA services over its FTTC network; and
- viii. **“Third Party”** means a person providing a public electronic communications network or a person providing a public electronic communications service;

12. For the purposes of interpreting this direction:

- a) except as otherwise defined, words or expressions used shall have the same meaning as they have been ascribed at Annex [X] of the [*title of final statement on wholesale local access market review*], and otherwise any word or expression as it has in the Act;

- b) headings and titles shall be disregarded;
- c) expressions cognate with those referred to in this direction shall be construed accordingly; and
- d) the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

Signed

[NAME]

[Position]

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

[DATE]

PART IV - NOTIFICATION OF PROPOSALS UNDER SECTION 48A THE COMMUNICATIONS ACT 2003

Proposals for setting SMP services conditions in relation to BT under section 45 of the Communications Act 2003 (“the Act”)

Background

On 1 December 2016, Ofcom published a document titled “*Narrowband Market Review: Consultation on proposed markets, market power determination and remedies for wholesale call termination, wholesale call origination and wholesale narrowband access markets*” (“the **2016 NMR Consultation**”)³⁵¹. Annex 6 to the 2016 NMR Consultation set out the notification under sections 48A and 80A of the Act, in which OFCOM proposed to:

- identify certain markets;
- make market power determinations; and
- set SMP services conditions

(“the **NMR Notification**”)

In relation to BT, OFCOM proposed in the NMR Notification that BT has Significant Market Power in a number of markets, including:

- wholesale fixed analogue exchange line services in the United Kingdom excluding the Hull Area³⁵²;
- wholesale ISDN30 exchange line services in the United Kingdom excluding the Hull Area; and
- wholesale ISDN2 exchange line services in the United Kingdom excluding the Hull Area.

As a result of the proposed market power determinations in the markets listed above, OFCOM proposed in the NMR Notification to set a number of SMP services conditions and directions on BT in each of the relevant markets. These included an obligation on BT, to provide network access (**Condition 1A** in Part 3 of Schedule 1 to the NMR

³⁵¹ <https://www.ofcom.org.uk/consultations-and-statements/category-1/narrowband-market-review>.

³⁵² This is the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communication (Hull) plc, (now known as KCOM).

Notification) and to publish a Reference Offer (**Condition 6** in Part 3 of Schedule 1 to the NMR Notification).

Proposed deletion of SMP services condition 1A.6 and amendments to proposed SMP services Conditions 1 and 6

OFCOM hereby gives notice of its proposals, in accordance with section 48A of the Act, in relation to the markets set out in paragraph 2 above to:

- (a) delete the SMP services condition 1A.6 proposed in the NMR Notification, as amended by Schedule 1 to this Notification, pursuant to their powers under section 48A of the Act
- (b) set the SMP services condition 6 proposed in the NMR Notification, as amended by Schedule 2 to this Notification, pursuant to their powers under section 48A of the Act.

Consequently, the NMR Notification should be read accordingly. It is proposed that this condition will take effect from the date of any notification under section 48(1) of the Act adopting the proposals set out in this present Notification.

The effects of, and reasoning for making, the amendments set out in paragraph 4 above are set out in the consultation document accompanying this Notification.

Ofcom's duties and legal tests

OFCOM considers that the proposals set out in this Notification comply with all the applicable legal tests, including the requirements of sections 45 to 47.

In making the proposals referred to in this Notification, OFCOM has:

- a) considered and acted in accordance with its general duties set out in section 3 of the Act and the six Community requirements in section 4 of the Act;
- b) taken due account of all applicable recommendations issued by the European Commission in accordance with section 4A of the Act; and
- c) taken utmost account of any relevant opinion, recommendation, guidance or regulatory practice adopted by BEREC in accordance with Article 3(3) of Regulation (EC) No 1211/2009.

Making representations

Representations may be made to OFCOM about any of the proposals set out in this Notification and the accompanying consultation by no later than 9 June 2017.

A copy of this Notification and the accompanying consultation document have been sent to the Secretary of State in accordance with section 48C(1) of the Act.

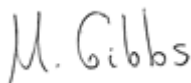
Interpretation

For the purposes of interpreting this Notification:

- a) except as otherwise defined, words or expressions used shall have the same meaning as they have been ascribed in the NMR Notification and otherwise any word or expression as it has in the Act;
- b) headings and titles shall be disregarded;
- c) expressions cognate with those referred to in this direction shall be construed accordingly; and
- d) the Interpretation Act 1978 (c. 30) shall apply as if this Direction were an Act of Parliament.

The Schedules to this Notification shall form part of this Notification.

Signed



Marina Gibbs
Competition Policy Director, Ofcom

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

31 March 2017

SCHEDULE 1

Proposed amendments to proposed SMP services conditions 1

Condition 1A – Network access on reasonable request

- 1A.1
(WFAEL,
WCO, WCT,
Interconnect)** The Dominant Provider must provide network access to a Third Party where that Third Party, in writing, reasonably requests it.
- 1A.2A
(WFAEL)** The provision of network access by the Dominant Provider in accordance with this Condition must:
- (a) take place as soon as reasonably practicable after receiving the request from a Third Party (and, in any event, in accordance with Condition 9); and
 - (b) be on:
 - (i) fair and reasonable terms, conditions and charges; and
 - (ii) be on such terms, conditions and charges as Ofcom may from time to time direct.
- 1A.2B
(WCO)** The provision of network access by the Dominant Provider in accordance with this Condition must:
- (a) take place as soon as reasonably practicable after receiving the request from a Third Party; and
 - (b) be on:
 - (i) fair and reasonable terms, conditions and charges; and
 - (ii) be on such terms, conditions and charges as Ofcom may from time to time direct.
- 1A.2C
(WCT,
Interconnect)** Except where Condition 1A.3 applies, the provision of network access by the Dominant Provider in accordance with this Condition must:
- (a) take place as soon as reasonably practicable after receiving the request from a Third Party; and
 - (b) be on:
 - (i) fair and reasonable terms, conditions and charges; and
 - (ii) be on such terms, conditions and charges as Ofcom may from time to time direct.
- 1A.3** Where Condition 5C or 5D applies, the provision of network access by the Dominant Provider in accordance with this Condition must:

**(WCT,
Interconnect)**

- (a) take place as soon as reasonably practicable after receiving the request from a Third Party; and
- (b) be on:
 - (i) fair and reasonable terms and conditions (excluding charges); and
 - (ii) such terms and conditions (excluding charges) as Ofcom may from time to time direct.

**1A.4
(WFAEL,
WCO, WCT,
Interconnect)**

The provision of network access by the Dominant Provider in accordance with this Condition must also include such associated facilities as are reasonably necessary for the provision of network access and such other entitlements as Ofcom may from time to time direct.

**1A.5
(WFAEL,
WCO, WCT,
Interconnect)**

The Dominant Provider must comply with any direction Ofcom may make from time to time under this Condition.

**1A.6
(WFAEL)**

~~The direction dated 20 March 2008 concerning service level agreements, as published on the same day at Annex 1 of the statement entitled “Service level guarantees: incentivising performance”, given by Ofcom under condition AA1(a).2, shall have force until such time as it is modified or withdrawn, as if it has been given under Condition 1A.2A from the date that this condition enters into force and that direction must be read accordingly.~~

SCHEDULE 2

Proposed amendments to proposed SMP services conditions 6

Condition 6 – Publication of a Reference Offer

- 6.1 Except in so far as Ofcom may from time to time otherwise consent in writing, the Dominant Provider must publish a Reference Offer in relation to the provision of network access pursuant to Conditions 1A, 1B, 1C and 2 (as applicable) and comply with the requirements set out below.
- 6.2 Subject to Condition 6.8 below, the Dominant Provider must ensure that a Reference Offer in relation to the provision of network access pursuant to Conditions 1A, 1B, 1C and 2 (as applicable) includes, where applicable, at least the following:
- (a) a description of the network access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of network access);
 - (b) the locations at which network access will be provided;
 - (c) any relevant technical standards for network access (including any usage restrictions and other security issues);
 - (d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);
 - (e) any ordering and provisioning procedures;
 - (f) relevant charges, terms of payment and billing procedures;
 - (g) details of interoperability tests;
 - (h) details of traffic and network management;
 - (i) details of maintenance and quality as follows:
 - (i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair);
 - (ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;
 - (iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;

- (iv) a definition and limitation of liability and indemnity; and
- (v) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services, changes to existing services or change to prices;
- (j) details of measures to ensure compliance with requirements for network integrity;
- (k) details of any relevant intellectual property rights;
- (l) a dispute resolution procedure to be used between the parties;
- (m) details of duration and renegotiation of agreements;
- (n) provisions regarding confidentiality of the agreements;
- (o) rules of allocation between the parties when supply is limited (for example, for the purpose of co-location or location of masts);
- (p) the standard terms and conditions for the provision of network access;

**6.2A
(WFAEL)**

Subject to Condition 6.8, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Wholesale Analogue Line Rental pursuant to Conditions 1A and 2 (as applicable) includes—

- (a) Service Level Commitments in respect of at least the following aspects of that service:
 - (i) availability of an appointment for the provision of the service;
 - (ii) attending appointments for the provision of the service;
 - (iii) completion of the provision of the service;
 - (iv) completion of the transfer of the service;
 - (v) disconnections made in error;
 - (vi) fault repair times; ~~and~~
 - (vii) attending fault repair appointments; and
 - (viii) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made, as applicable; and

- (b) Service Level Guarantees in respect of the Service Level Commitments specified in Condition 6.2A(a)(i) to (a)(viii) above.

**6.2B1
(ISDN30)**

Subject to Condition 6.8, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Wholesale ISDN30 Line Rental pursuant to Conditions 1B and 2 (as applicable) includes–

- (a) Service Level Commitments in respect of at least the following aspects of that service:
 - (i) availability of an appointment for the provision of the service;
 - (ii) attending appointments for the provision of the service;
 - (iii) completion of the provision of the service;
 - (iv) completion of the transfer of the service;
 - (v) disconnections made in error;
 - (vi) fault repair times; ~~and~~
 - (vii) attending fault repair appointments; and
 - (viii) availability of the relevant operational support systems by which requests for service transfers and fault repair are made, as applicable; and
- (b) Service Level Guarantees in respect of the Service Level Commitments specified in Condition 6.2B1(a)(i) to (a)(viii) above.

**6.2B2
(ISDN30)**

Subject to Condition 6.8, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Wholesale ISDN30 Line Rental pursuant to Conditions 1C and 2 (as applicable) includes–

- (a) Service Level Commitments in respect of at least the following aspects of that service:
 - (i) completion of the Transfer of the service;
 - (ii) disconnections made in error;
 - (iii) fault repair times; ~~and~~
 - (iv) attending fault repair appointments; and
 - (v) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made, as applicable; and

- (b) Service Level Guarantees in respect of the Service Level Commitments specified in Condition 6.2B2(a)(i) to (a)(v) above.

**6.2C1
(ISDN2)**

Subject to Condition 6.8, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Wholesale ISDN2 Line Rental pursuant to Conditions 1B and 2 (as applicable) includes–

- (a) Service Level Commitments in respect of at least the following aspects of that service:
 - (i) availability of an appointment for the provision of the service;
 - (ii) attending appointments for the provision of the service;
 - (iii) completion of the provision of the service;
 - (iv) completion of the transfer of the service;
 - (v) disconnections made in error;
 - (vi) fault repair times; ~~and~~
 - (vii) attending fault repair appointments; and
 - (viii) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made, as applicable; and
- (b) Service Level Guarantees in respect of the Service Level Commitments specified in Condition 6.2C1(a)(i) to (a)(viii) above.

**6.2C2
(ISDN2)**

Subject to Condition 6.8, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Wholesale ISDN2 Line Rental pursuant to Conditions 1C and 2 (as applicable) includes–

- (a) Service Level Commitments in respect of at least the following aspects of that service:
 - (i) completion of the Transfer of the service;
 - (ii) disconnections made in error;
 - (iii) fault repair times; ~~and~~
 - (iv) attending fault repair appointments; and

- (v) availability of the relevant operational support systems by which requests for service transfers and fault repair are made, as applicable; and
 - (b) Service Level Guarantees in respect of the Service Level Commitments specified in Condition 6.2C2(a)(i) to (a)(y) above.
- 6.3 (WFAEL, ISDN30, ISDN2, WCT, Interconnect)**

To the extent that the Dominant Provider provides to itself network access that:

 - (a) is the same, similar or equivalent to that provided to any other Third Party; or
 - (b) may be used for a purpose that is the same, similar or equivalent to that provided to any other Third Party,

in a manner that differs from that detailed in a Reference Offer in relation to network access provided to any other Third Party, the Dominant Provider must ensure that it publishes a Reference Offer in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in Condition 6.2.
- 6.4**

The Dominant Provider must, on the date that this Condition enters into force, publish a Reference Offer in relation to any network access that it is providing as at the date that this Condition enters into force.
- 6.5**

The Dominant Provider must as soon as reasonably practicable update and publish the Reference Offer in relation to any amendments or in relation to any further network access provided after the date that this Condition enters into force.
- 6.6**

Publication referred to above shall be effected by placing a copy of the Reference Offer on any relevant publicly accessible website operated or controlled by the Dominant Provider.
- 6.7**

The Dominant Provider must send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts as have been requested).
- 6.8**

The Dominant Provider must make such modifications to the Reference Offer as Ofcom may direct from time to time.
- 6.9 (WFAEL, ISDN30, ISDN2, WCT & Interconnect)**

The Dominant Provider must provide network access at the charges, terms and conditions in the relevant Reference Offer and must not depart therefrom either directly or indirectly.
- 6.10**

The Dominant Provider must comply with any direction Ofcom may make from time to time under this Condition.

6.11

In this Condition 6,

- (a) “**Service Level Commitment**” means the quality standards that the Dominant Provider must meet when performing its obligations;
- (b) “**Service Level Guarantees**” means a commitment specifying the amount payable proactively by the Dominant Provider to a Third Party for a failure to adhere to a Service Level Commitment.

Annex 9

Glossary

Access Network: The part of the network that connects directly to customers from the local exchange.

Asymmetric Digital Subscriber Line (ADSL): A type of digital subscriber line technology that supports higher bandwidth on downlink transmissions compared to uplink transmissions, i.e. from the exchange to the end user than from the end user to the exchange.

Bandwidth: The rate at which data can be transmitted. Usually expressed in bits per second (bits/s).

BCMR: Business Connectivity Market Review.

BEREC: Body of European Regulators for Electronic Communications.

Broadband Boost (BBB): A chargeable investigation product from Openreach.

Business customer: A retail customer to whom BT has supplied a product that BT has designed for businesses

Capital expenditure (Capex): The firm's level of investment in fixed assets over the course of the financial year.

Charge Control: A control which sets the maximum price that a telecoms provider can charge for a particular product or service. Most charge controls are imposed for a defined period.

CIDT: Copper Integrated Demand Testing

Contract Delivery Date (CDD): A date, agreed between Openreach and a telecoms provider for the provision of a service such as an MPF or WLR installation.

D-side: Distribution side. The segment of BT's access network between the Primary Cross Connection Points (street cabinets) and Distribution Points.

Digital Subscriber Line (DSL): A family of technologies generically referred to as DSL, or xDSL used to add a broadband service to a phone line provided using a pair of copper wires (known as a twisted copper pair).

Digital Subscriber Line Access Multiplexer (DSLAM): A network device, located in a telephone exchange or street cabinet that provides broadband services to multiple premises over the copper access network using DSL technologies.

Duct and Pole Access (DPA): A wholesale access service allowing a telecoms provider to make use of the underground duct network and the telegraph poles of another telecoms provider.

Ducts: Underground pipes which hold copper and fibre lines.

E-side: Exchange side. The segment of BT's access network between telephone exchanges and Primary Cross Connection Points (street cabinets).

Early Life Failure (ELF): a fault with a telecoms service within 28 calendar days of installation.

EC: European Commission.

Equivalence Management Platform (EMP): A set of operational support systems and associated processes put in place by Openreach to support the implementation of EOI.

Equivalence of Input (EOI): A remedy designed to prevent BT from discriminating between its competitors and its own business in providing upstream inputs. This requires BT to provide the same wholesale products to all telecoms providers including BT's own downstream division on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all telecoms providers (including BT) of the same commercial information about such products, services, systems and processes.

Ethernet: A packet-based technology originally developed for use in Local Area Networks (LANs) but now also widely used in telecoms providers' networks for the transmission of data services.

Exchange: The BT telephone exchange, to which customers are directly connected.

Fault Volume Reduction programme (FVR programme): A proposed Openreach programme which aims to reduce the volume of faults arising on copper lines.

FAMR: Fixed Access Market Review.

Fibre To The Cabinet (FTTC): An access network structure in which the optical fibre extends from the exchange to a street cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.

Fibre To The Premises (FTTP): An access network structure in which the optical fibre network runs from the local exchange to the customer's house or business premises. The optical fibre may be point-to-point – there is one dedicated fibre connection for each home – or may use a shared infrastructure such as a GPON. Sometimes also referred to as Fibre to the home (FTTH), or full-fibre.

Generic Ethernet Access (GEA): BT's wholesale product providing telecoms providers with access to BT's FTTC and FTTP networks in order to supply higher speed broadband products. BT currently meets its obligation to provide VULA using the GEA service.

Glidepath: A series of steps from a point of origin to a target.

GM areas: A geographic area which is the responsibility of an Openreach General Manager. There are currently 9 GM areas.

Hull Area: The area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under Section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc (KCOM).

In Life Fault (ILF): a fault with a telecoms service that occurs more than 28 days after installation.

ISDN2: A type of digital telephone line service that supports telephony and switched data services. ISDN2 allows a business to handle two phone calls simultaneously. It is primarily used by smaller businesses.

ISDN30: A type of digital telephone line service that provides up to 30 lines over a common digital bearer circuit. These lines provide digital voice telephony, data services and a wide range of ancillary services. It is primarily used by larger businesses.

KPIs: Key performance indicators.

Leased Line: A permanently connected communications link between two premises dedicated to the customer's exclusive use.

Local Loop: The access network connection between the customer's premises and the local serving exchange, usually comprised of two copper wires twisted together.

Local Loop Unbundling (LLU): A process by which a dominant provider's local loops are physically disconnected from its network and connected to a competing provider's networks. This enables operators other than the incumbent to use the local loop to provide services directly to customers.

Main Distribution Frame (MDF): An internal wiring frame where local loops are terminated and cross connected to exchange equipment by flexible wire jumpers.

Matters Beyond Our Reasonable Control (MBORC): Matters beyond our (BT's) reasonable control. A force majeure clause in Openreach's contracts.

MDF Jumper Cable (Jumper): A jumper is a flexible pair of copper wires. A jumper provides the connection between local loop copper pairs and exchange equipment. The MDF blocks provide appropriate connectors that facilitate the connection and removal of jumpers.

Metallic Path Facility (MPF): The provision of access to the copper wires from the customer premises to a BT MDF that covers the full available frequency range, including both narrowband and broadband channels, allowing a competing provider to provide the customer with both voice and/or data services over such copper wires.

Next Generation Access (NGA) Networks: Wired access networks which consist wholly or in part of optical elements and which are capable of delivering broadband access services with enhanced characteristics (such as higher throughput) as compared to those provided over copper access networks. In most cases, NGAs are the result of an upgrade of an already existing copper or co-axial access network.

NMR: Narrowband Market Review.

NRA: National Regulatory Authority.

Ofcom: The Office of Communications.

Office of the Telecommunications Adjudicator (OTA2): An independent body that facilitates discussion between telecoms providers on operational issues related to new and existing telecoms products and services.

Openreach: The access division of BT established by Undertakings in 2005.

Percentage of New Connections (PNC): This percentage is equal to the number of new connections ÷ number of line rentals

Physical Infrastructure Access (PIA): A regulatory obligation under which BT is required to allow telecoms providers to deploy NGA networks in the physical infrastructure of its access network.

Primary Cross Connection Point (PCP): A street cabinet (or equivalent facility) located between the customer's premises and BT's local serving exchanges, which serves as an intermediary point of aggregation for BT's copper network.

QoS remedies: Quality of service standards and reporting requirements

Regulatory Financial Statements (RFS): The financial statements that BT is required to prepare by Ofcom. They include the published RFS and Additional Financial Information provided to Ofcom in confidence.

Residential customer: A retail customer to whom BT has supplied a product that BT has not designed for businesses

Service Level Agreement (SLA): A contractual commitment provided by Openreach to telecoms providers about service standards.

Service Level Guarantee (SLG): A contractual commitment by Openreach to telecoms providers specifying the amount of compensation payable by Openreach to a telecoms provider for a failure to adhere to an SLA.

Service Maintenance Level 1 (SML1): A repair service contract offered by Openreach for fault repair by the end of the next working day plus one day (excluding Saturday) after the acceptance of faults by Openreach.

Service Maintenance Level 2 (SML2): A repair service contract offered by Openreach for fault repair by the end of the next working day (including Saturday) after the acceptance of faults by Openreach.

Shared Metallic Path Facility (SMPF)/Shared Access: The provision of access to the copper wires from the customer's premises to a BT MDF that allows a competing provider to provide the customer with broadband services, while BT continues to provide the customer with conventional narrowband communications.

Significant Market Power (SMP): The significant market power test is set out in European Directives. It is used by National Regulatory Authorities (NRAs), such as Ofcom, to identify those telecoms providers which must meet additional obligations under the relevant Directives.

Small and Medium Sized Enterprises (SME): Businesses with 249 or fewer employees.

Senior Operations Manager (SOM): A geographic area which is the responsibility of an Openreach Senior Operations Manager. There are currently 58 SOM areas.

Special Faults Investigation (SFI): A chargeable fault investigation product from Openreach.

Standard broadband (SBB): A broadband connection that can support a maximum download speed of less than 30Mb/s.

Strategic Review of Digital Communications: Also referred to as the Digital Communications Review (DCR), is a document Ofcom published in February 2016 which set out a ten-year vision for communications services in the UK.

Superfast Broadband (SFBB): A broadband connection that can support a maximum download speed of between 30Mbit/s and 300Mbit/s.

Telecoms provider: A person who provides an electronic communications network or provides an electronic communications service.

The Act: The Communications Act 2003.

Tie Cable: A cable that connects equipment to the MDF.

Time-Related Charges (TRCs): Time Related Charges are raised by Openreach to recover costs incurred when Openreach engineers perform work not covered under the terms of the Openreach standard service.

Very-high-bit-rate digital subscriber line (VDSL): DSL technologies offering superfast broadband speeds. On Openreach's FTTC network which uses VDSL technology, services of up to 80Mb/s downstream and 20Mb/s upstream are currently offered. VDSL, in this Consultation, refers to all generations of the technology.

Virtual Unbundled Local Access (VULA): Provides access to BT's FTTC and FTTP network deployments. Telecoms providers connect to the VULA service at a 'local' aggregation point and are provided a virtual connection from this point to the customer premises.

Wholesale Fixed Analogue Exchange Line (WFAEL): A narrowband analogue access connection between a customer's premises and a local exchange.

Wholesale Line Rental (WLR): The service offered by Openreach to other telecoms providers to enable them to offer retail line rental services in competition with BT's own retail services.

Wholesale Local Access (WLA): The market that covers fixed telecommunications infrastructure, specifically the physical connection between customers' premises and a local exchange.

WiFi: A short range wireless access technology that allows devices to connect to the internet. These technologies allow an over-the-air connection between a wireless client and a base station or between two wireless clients.